

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Friday 22nd April 2022 - Morning

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 new gym requires software to record certain processes. Participants wishing to join the gym have to apply for membership. The gym expects to offer pilates, yoga, keep fit and spinning classes run by its own staff for its members, as well as allowing rooms to be used by independent teachers. The classes are run on the premises in various rooms. Classes will be organised for beginners, intermediate and advanced members. Each set of in-house classes consists of six sessions in a specified room with an assigned instructor, one per week for each of the type of member and are limited to a maximum number of members. A member will contact the gym to enrol on a specific set of classes. Classes have to be paid via credit or debit card or cash before the sessions. The price varies according to the type of class. Once payment has been received the member will be enrolled for the appropriate six sessions.

- a) Briefly describe the stages in the following methods which could be used to develop the above system, including techniques.
 - i) A structured method **(8 marks)**
 - ii) An iterative method. **(6 marks)**
- b) Part of the system will be required to deal with membership, enrolment, payment, attendance and hiring of a room. Draw a high-level data flow diagram detailing the overview of the system. **(8 marks)**
- c) Identify the main entities and typical attributes within the system. **(8 marks)**

A2.

- a) Describe **FOUR** ways an analyst can obtain information from management and users about the requirements of a new system and the processes of the existing system. **(12 marks)**
- b) What are the main functions of a project manager in managing a very large system development project? **(12 marks)**
- c) What are the following acronyms and what is their purpose?
 - i) SWOT analysis **(3 marks)**
 - ii) CPM. **(3 marks)**

A3.

- a) What is the purpose of normalisation in relational data analysis and why should it be used in addition to logical data modelling?
(6 marks)
- b) Using the case study in question 1, explain the **THREE** types of relationships and **THREE** contingencies within a relationship. Draw examples of each.
(9 marks)
- c) Write brief notes on the following:
- i) A data warehouse
(3 marks)
 - ii) Data mining.
(3 marks)
- d) Describe the functions of the following departments in an online delivery company and give typical examples of the data they would need in a database:
- i) Order processing department
(3 marks)
 - ii) Personnel department (HRM)
(3 marks)
 - iii) Warehouse.
(3 marks)

A4.

The following questions concern the development of a large complicated system.

- a) Describe a testing strategy and methods that can be used to ensure that when the system is implemented it is thoroughly tested.
(10 marks)
- b) Explain why the system should be documented and describe typical manuals that should be produced.
(10 marks)
- c) Prepare a short report for a company's board of directors explaining how their data can be secured against all current threats from the internet.
(10 marks)

[Turn Over]

Section B

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

B5.

Explain what is meant by the following mathematical terms, using a simple example.

- a) Mean (3 marks)
- b) Standard deviation (3 marks)
- c) Mode (3 marks)
- d) Median. (3 marks)

B6.

A company wishes to advertise for a new Database Administrator (DBA).

Outline a job advert highlighting the skills the DBA requires. (12 marks)

B7.

IBM's definition of Big Data consists of 4 V's. Within this context, explain the meaning of the following terms.

- a) Variety (3 marks)
- b) Veracity (3 marks)
- c) Volume (3 marks)
- d) Velocity. (3 marks)

B8.

Discuss the advantages and disadvantages of the following, with respect to Human Computer Interaction (HCI):

- a) Keyboard and mouse (4 marks)
- b) Touch screen (4 marks)
- c) Voice. (4 marks)

B9.

Briefly outline the differences between the following management structures:

- a) Hierarchical (6 marks)
- b) Matrix. (6 marks)

B10.

What is meant by the following Rapid Application Development terms?

- a) Joint Application Development (4 marks)
- b) CASE (4 marks)
- c) Timeboxing. (4 marks)

B11.

The British Computer Society (BCS) has a code of conduct which it expects all its members to follow.

Outline what you would expect to be contained within a code of conduct for a computing organisation. (12 marks)

B12.

Outline the processes and stages that a company should follow to migrate from an internally based computer system to one that is entirely located in a third-party cloud. (12 marks)

End of Examination