BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

SMART SYSTEMS

Friday 7th May 2021 – Afternoon

Answer **any** FOUR questions out of SIX. All questions carry equal marks.

Time: TWO 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.

Artificial Intelligence (AI) is increasingly being used in Industry 4.0 and Smart Manufacturing:

    a) Define and briefly describe Artificial Intelligence (AI).

(9 marks)

    b) Briefly define Smart Manufacturing Systems.

(6 marks)

    c) Identify and describe **TWO** Smart Manufacturing characteristics.

(10 marks)

A2.

Big Data has given rise to a new field of AI and that is Machine Learning (ML).

    a) Explain what Machine Learning is, its purpose, and how it is used in data analytics.

(15 marks)

    b) Identify **TWO** areas where Machine Learning is applied, illustrate your answer with relevant examples.

(10 marks)

A3.

Big Data and Data Analytics are now widely used globally for a variety of business purposes.

    a) Define and explain the purpose of data analytics using relevant examples to illustrate your answers.

(15 marks)

    b) Define Data Mining and explain its purpose.

(10 marks)

Section B
Answer Section B questions in Answer Book B

B4.

The nature of Cyber Physical Systems (CPS) introduces many cybersecurity challenges in Smart Systems.

    a) Identify and discuss **THREE** examples of these challenges instigated by the implementation of Cyber Physical Systems.

(15 marks)

    b) Explain the purpose of cybersecurity with respect to Cyber Physical Systems.

(10 marks)

B5.

Cloud technology is an essential enabling technology for Smart Systems.

    a) Define Cloud technology and its purpose.

(10 marks)

    b) Discuss the ethical considerations of cloud technology and support your answers with relevant examples.

(15 marks)

B6.

The domain of Smart Systems has a number of security challenges.

    a) Identify and discuss security challenges with **TWO** enabling technologies for Smart Systems development.

(10 marks)

    b) Define and explain the purpose of Cyber Physical Systems (CPS) security risk management, using relevant examples to support your answer.

(15 marks)

END OF EXAMINATION