

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 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.

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