

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

SMART SYSTEMS

Tuesday 18th April 2023 - 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.

Smart Systems are becoming increasingly prevalent in everyday life.

- a) Give a definition of Smart Systems and discuss their capabilities and purpose.
(10 marks)
- b) There are three generations of Smart Systems, identify and describe these **THREE** generations.
(15 marks)

A2.

Blockchain technology is increasingly used in Smart applications.

- a) What do you understand by the term 'Blockchain Technology' and how might you see this technology being used in Smart applications?
(13 marks)
- b) Blockchain is renowned for its use in cryptocurrencies. Define cryptocurrencies and discuss how they might be used with Blockchain Technology.
(12 marks)

A3.

Artificial Intelligence (AI) is concerned with the development of systems that exhibit characteristics associated with intelligence in human behaviour such as Artificial Neural Networks (ANNs).

- a) Define Artificial Neural Networks (ANNs) and explain their purpose.
(10 marks)
- b) Many smart applications of Artificial Intelligence (AI) are used in business and industry. Identify and discuss **THREE** practical applications of AI used in the development of Smart Systems.
(15 marks)

Section B
Answer Section B questions in Answer Book B

B4.

Machine Learning and Cloud Technology are enabling technologies in the development of Smart Systems.

- a) Outline the meaning of Machine Learning and how it is used in the development of Smart Systems.
(10 marks)
- b) Define Cloud Technology and identify and discuss **TWO** ethical considerations with using Cloud Technology. Illustrate your answer with relevant examples.
(15 marks)

B5.

The Internet of Things (IoT), is a key enabling technology for the development of Smart Systems.

- a) Describe and discuss the purpose of the Internet of Things (IoT), using **THREE** advantages for its use.
(15 marks)
- b) Identify and discuss the benefits of Smart Cities using at least **TWO** examples.
(10 marks)

B6.

- a) Pervasive Computing is a core enabler in the development of Smart Systems. Explain and discuss what Pervasive Computing is in relation to Smart Systems development.
(10 marks)
- b) With the increasing use of the Internet of Things (IoT), there are a number of challenges that come with it.

Identify and discuss **THREE** challenges with the Internet of Things (IoT) and include relevant examples to support your answer.
(15 marks)

END OF EXAMINATION