BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

SMART SYSTEMS

Thursday 7th October 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.
The term 'Smart' is now used in many different areas, for example Smart Industry, Smart Service Systems, etc.

    a) Define and explain the purpose of Smart Service Systems.

(10 marks)

    b) Define and describe the term Smart Industry.

(15 marks)

A2.
Applications of Artificial Intelligence (AI), for example Data Mining, are increasingly being used in the development of Smart Systems.

    a) Identify, with a brief description for each, **THREE** practical applications of AI.

(9 marks)

    b) Discuss **TWO** advantages and **TWO** disadvantages of Data Mining and the use of Data Analytics in business.

(16 marks)

A3.
"With the rise of big data, Machine Learning (ML) has emerged as one of the best problem-solving techniques in some areas".

    a) Explain the general function of Machine Learning (ML).

(10 marks)

    b) Identify **THREE** areas where Machine Learning (ML), is the best problem-solving technique and discuss how it is being used in each of these areas.

(15 marks)

B4.
"Cyber Physical Systems (CPS) will provide the next generation of 'smart', co-engineered interacting components connected over diverse networks", and will pose many security challenges.

a) Define and explain the purpose of Security and Risk Management.

(10 marks)

b) Identify and discuss elements of the risk management process in Cyber Physical Systems.

(15 marks)

B5.
Smart Systems rely on a number of enabling technologies for their development and implementation and use.

a) Blockchain is an enabling technology for Smart Systems. Define Blockchain technology and its purpose.

(10 marks)

b) Discuss **THREE** advantages of cloud technology and support your answers with relevant examples.

(15 marks)

B6.
The Internet of Things (IoT) is an essential technology in Smart Systems.

a) Define and discuss the purpose of the Internet of Things (IoT) using relevant examples to illustrate your answers.

(15 marks)

b) Identify and discuss **TWO** examples of Smart Systems in operation today.

(10 marks)

End of Examination