SMART SYSTEMS
Thursday 6th October 2022 - 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.
A1. Artificial Intelligence (AI) technologies are already present throughout our lives.
   a) Give a definition of AI and identify and describe the TWO different levels of AI. Use relevant examples to illustrate your answer. (12 marks)
   b) Give a definition for Neural Networks and using TWO relevant examples, discuss their purpose. (13 marks)

A2. Cyber Physical Systems (CPS), form the basis for emerging and future smart services.
   a) Define the term Cyber Physical Systems. (8 marks)
   b) Identify and describe FOUR main features of Cyber Physical Systems. (17 marks)

A3. There are a number of enabling technologies used in the development of smart systems.
   a) Identify and describe THREE enabling technologies used in the development of smart systems. (15 marks)
   b) Smart Manufacturing is becoming increasingly popular. Identify and discuss the purpose of TWO Smart Manufacturing Characteristics. (10 marks)

B4. Data Mining has become an essential part of business and industry.
   a) Give a definition of Data Mining and explain how it functions. (10 marks)
   b) Describe the term ‘Smart Data’. (5 marks)
   c) Define Data Analytics and explain its purpose. (10 marks)

B5. With the increasing use of Cyber Physical Systems, there are a number of challenges that come with it.
   a) Using relevant examples, discuss THREE main issues with Cyber Physical Systems. (15 marks)
   b) Define and explain what is meant by Cyber Security Risk Management. (10 marks)

B6. a) There are a number of challenges with the use of smart applications. Identify and discuss TWO areas of smart systems applications and the challenges they might face. Support your answer with relevant examples. (10 marks)
   b) Cloud technology is one of the enabling technologies for the development of smart systems, however, it brings advantages and also many disadvantages. Discuss THREE disadvantages of cloud technology. Support your answer with relevant examples. (15 marks)

End of Examination