UNIVERSITI KUALA LUMPUR
KAMPUS CAWANGAN MALAYSIAN SPANISH INSTITUTE

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	:	SFB36503 (V1)
COURSE TITLE	:	SMART MANUFACTURING
PROGRAMME NAME	:	BACHELOR OF ENGINEERING TECHNOLOGY (HONS) IN MANUFACTURING (AUTOMOTIVE)
DATE	:	23 JANUARY 2026
TIME	:	9:00AM - 12:00PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of ONE sections.
4. Section A consist of five questions. Answer FOUR (4) questions only.
5. Please write your answer on the answer booklet provided.
6. Please answer all questions in English only.
7. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

THERE ARE 5 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

Big data encompasses exceptionally large data sets, potentially containing billions of rows and parameters. In the manufacturing industry, this data is collected at every stage of production, incorporating information from machines, devices, and operators. These data sets can be both structured and unstructured. The sheer volume and complexity involved, alongside the development of specialized tools, techniques, and best practices, have driven significant advancements in data science and big data analytics within the manufacturing sector.

Explain FIVE (5) uses case for big data in manufacturing. Please use and appropriate example for each case.

(25 marks)

Question 2

Smart factories are comprised of intelligent machines, devices, and control equipment that monitor vital parameters of the manufacturing processes. These improvements have not only altered the factory floor infrastructures, promoting steady and precise collaboration between machines but have also altered machinery requirements, increasing demand for reliable sensors.

Due to the importance of sensors in smart manufacturing, develop a table to discuss position sensors features. Please include different sensor type, characteristic, materials, used, advantages and disadvantages.

(25 marks)

Question 3

Supply chain integration is a process where all the parties involved with the fulfilment of a product are integrated into a single system. This integration process requires significant coordination and alignment to ensure everyone effectively works toward the same goal.

(a) Discuss THREE (3) advantages and TWO (2) disadvantages of integrated supply chain management.

(10 marks)

(b) Sustainable manufacturing addresses the production stage of the product life cycle without neglecting the economic and environmental consequences of activities in other life cycle stages. Discuss FIVE (5) sustainable activities that should be initiated by manufacturing organizations.

(15 marks)

Question 4

Smart Manufacturing System (SMS) digitizes every part of the manufacturing system with interoperability, real-time control and monitoring, flexible manufacturing, quick response to market changes, advanced sensors and big data analytics with enhanced productivity. The scope of smart manufacturing technologies has become broader due to the inter-operation of various technologies resulting in cost-effectiveness, time-saving, easy configuration, better understanding, quick response to market demand, flexibility and remote monitoring.

(a) Identify five smart manufacturing technologies currently adopted in the industry.

(5 marks)

(b) Identify FIVE (5) examples where smart manufacturing technology is used in industry.

(5 marks)

(c) Discuss the role of smart manufacturing technologies in improving productivity

(15 marks)

Question 5

Cyber-physical production systems consist of autonomous and cooperative elements and subsystems connected based on the context within and across all production levels, from processes through machines to production and logistics networks.

(a) Identify two virtual world and two physical world components in a cyber-physical system.

(4 marks)

(b) Explain THREE (3) main characteristics of Cyber-physical production systems.

(6 marks)

(c) Discuss FIVE (5) level Cyber-physical production systems implementation.

(15 marks)

END OF EXAMINATION PAPER