QP Code: RA22BTECH415 | Reg. No | | | | | | | | | | | AR21/ 22

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Sixth Semester – Regular/Supplementary) Examinations, April 2025

21BCMPC36003/22BCMPC36003 – Application of Machine Learning in Industry
(CSE(AIML))

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Define Sensor and Actuators in IOT.	CO1	K1
b. Write the code in Arduino to blink the in-build led.	CO2	K2
c. Which of the communication protocols are used by IoT?	CO2	K1
d. Define Industry 4.0.	CO3	K1
e. What do you mean by defect detection?	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

Answer ***All*** the questions	Marks	CO #	Blooms Level
2. a. Define the IoT Protocols and communication models. Explain different types of communication models in IoT.	7	CO1	K2
b. Elaborate the role of IoT in pollution control systems.	8	CO2	K2
(OR)			
c. Explain different application layer protocols for the IoT.	7	CO1	K2
d. Explain in detail the IoT Levels for implementing IoT environment.	8	CO2	K2
3.a. You are developing a smart home system that allows users to control lights, thermostats, and door locks remotely. Design a system architecture, including hardware components, communication protocols, and software components, to achieve this functionality. Consider security and scalability. Implement a Python script that reads temperature and humidity data from a sensor, stores it in a database, and sends an alert to a user's phone if the temperature exceeds a certain threshold.	15	CO3	K3
(OR)			
b. Develop an IoT system for monitoring soil moisture and temperature in a farm, and sending alerts to farmers when irrigation is needed. Programming Focus: Sensors, Raspberry Pi, communication protocols (e.g., LoRaWAN, Sigfox), cloud platform (e.g., AWS IoT, Azure IoT), data visualization. Question: Write a Python script that reads data from a soil moisture sensor, uses a machine learning model to predict irrigation needs, and sends a notification to a user's mobile app.	15	CO3	K3

Programming Focus: Python, machine learning libraries (e.g., scikit-learn, TensorFlow), sensor libraries.

4.a.	Explain the evolution of manufacturing from Industry 1.0 to Industry 4.0. • Highlight the role of automation and cyber-physical systems. • Discuss how Industry 4.0 is transforming traditional manufacturing.	15	CO3	K2
	(OR)			
b.	Discuss predictive maintenance in Industry 4.0. • Explain its importance and working principles. • Provide real-world case studies of predictive maintenance applications. • Describe any ML algorithms used in predictive maintenance.	15	CO3	K2
5.a.	Describe the role of machine learning in quality control and supply chain optimization. • Include defect detection using image recognition. • Explain ML techniques in demand forecasting and inventory management. • Add suitable case studies or examples.	15	CO4	K2
	(OR)			
b.	Write a detailed note on digital twins and their applications in manufacturing. • Define and explain the concept of digital twins. • Discuss simulation and modelling for process optimization. • How are digital twins built and used in smart factories?	15	CO4	K2

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