QP Code: RA23BTECH157 | Reg. No | | | | | | | | | | | AY 23

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

B. Tech (Sixth Semester - Regular) Examinations, April 2026

23BCMPC36002– Application of Machine Learning in Industry

(CSE-AIML)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	Identify key IoT design principles used in smart agriculture systems.	CO1	K1
b.	Explain the role of IoT gateways in industrial communication.	CO2	K2
c.	Define Cyber-Physical Systems with an industrial example.	CO3	K1
d.	Explain supervised learning in the context of industrial prediction.	CO4	K2
e.	Define Edge Computing for real-time industrial analytics.	CO6	K1

PART – B **(10 x 5 = 50 Marks)**

		Marks	CO #	Blooms Level
	Answer ***ALL*** the questions			
2. a.	A smart irrigation system uses IoT sensors for soil moisture monitoring. Explain how sensing and actuation work in this system.	5	CO1	K2
b.	Write a Arduino program to interface a soil moisture sensor and trigger irrigation.	5	CO2	K3
	(OR)			
c.	An IoT system suffers from high latency in data transmission. Analyze the role of gateways in improving performance.	5	CO1	K4
d.	Develop a Python program using sockets to simulate communication between IoT devices.	5	CO2	K3
3.a.	A company implements smart manufacturing using IoT and ML. Explain how Industry 4.0 enables this transformation.	5	CO3	K3
b.	Implement a Decision Tree algorithm in Python to classify machine conditions.	5	CO4	K2
	(OR)			
c.	An industry collects machine data but fails to predict failures accurately. Analyze suitable ML models for predictive maintenance.	5	CO3	K4
d.	Build a Random Forest model for failure prediction and evaluate its performance.	5	CO4	K4
4.a.	An industrial dataset contains missing and inconsistent values. Apply preprocessing techniques to prepare it for ML modeling.	5	CO6	K3
b.	Write Python code for feature scaling and encoding categorical industrial data.	5	CO6	K3
	(OR)			
c.	A factory wants to create a Digital Twin of its production unit. Evaluate its feasibility and expected outcomes.	5	CO5	K5
d.	Design a Python-based Digital Twin simulation for a production process.	5	CO5	K6
5.a.	A logistics company wants to minimize delivery time using ML.	5	CO5	K4

	Analyze suitable optimization techniques.			
b.	Develop a Python-based route optimization model using a heuristic algorithm.	5	CO5	K3
	(OR)			
c.	An automated robotic system faces safety risks during human interaction. Evaluate ML-based safety models to address this issue.	5	CO5	K5
d.	Create an anomaly detection model in Python for robotic safety monitoring.	5	CO6	K6
6.a.	A smart factory requires real-time analytics. Explain how real-time ML systems are implemented in such environments.	5	CO6	K2
b.	A manufacturing company collects real-time data from multiple IoT devices, but faces delays in decision-making due to cloud dependency. **Analyze** how edge computing can improve system performance and reliability in this scenario.	5	CO6	K4
	(OR)			
c.	An industry is planning to deploy ML models either on cloud servers or edge devices for real-time monitoring. **Evaluate** both approaches and justify which deployment strategy is more suitable for time-critical applications.	5	CO6	K5
d.	A smart factory requires a real-time monitoring system for detecting anomalies in machine operations. **Design** a complete ML-based solution including data collection, preprocessing, model selection, and deployment (edge/cloud).	5	CO6	K6

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