Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3171930 Date:11-12-2024

Subject Name: Industrial Internet of Things

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Define the Industrial Internet of Things (IIoT) and its significance in manufacturing.	**03**
	(b)	Enlist real life examples of IIOT in Manufacturing Sector.	**04**
	(c)	Explain how Cyber-Physical Production integrates digital technologies with physical manufacturing processes.	**07**
Q.2	**(a)**	How Cyber Physical Engineering (CPE) applied in manufacturing?	**03**
	(b)	Explain supervisory controllers in the context of Cyber-Physical Systems (CPS).	**04**
	(c)	Define Cyber-Physical Engineering (CPE) and its role in integrating digital and physical systems.	**07**
		OR	
	(c)	Discuss the challenges and limitations of modeling in Cyber-Physical Engineering	**07**
Q.3	**(a)**	Explain how CPS-based manufacturing aligns with the principles of Industry 4.0.	**03**
	(b)	Discuss role of Industrial Internet of Things (IIoT) in communication and networking in manufacturing.	**04**
	(c)	Explain Cyber-Physical Systems (CPS) in context to enhance the resiliency of production facilities.	**07**
		OR	
Q.3	**(a)**	Discuss the challenges in implementing CPS-based manufacturing and Industry 4.0	**03**
	(b)	Describe the benefits of IIoT communication and networking	**04**
	(c)	Explain the concept of integrating knowledge bases, databases, and machine vision systems in manufacturing.	**07**
Q.4	**(a)**	What is digital production, and how does it relate to CPS?	**03**
	(b)	Discuss the benefits and challenges of implementing CPS in machine tools.	**04**
	(c)	What is condition monitoring? Explain its importance in manufacturing.	**07**
		OR	
Q.4	**(a)**	How can CPS be used to improve quality control in manufacturing?	**03**
	(b)	Discuss applications of CPS in machine tools.	**04**
	(c)	Analyze the benefits of adopting big data and machine learning in manufacturing, including improved decision-making, cost savings, and competitiveness.	**07**
Q.5	**(a)**	Discuss the role of Augmented Reality in IIoT.	**03**
	(b)	Discuss the relationship between workers and Cyber-Physical Systems (CPS).	**04**
	(c)	Explain the characteristics and components of advanced manufacturing, such as digitalization, automation, and customization.	**07**
		OR	
Q.5	**(a)**	Enlist Strategies to support user intervention	**03**
	(b)	Discuss the importance of user intervention capabilities in CPS-enabled environments.	**04**
	(c)	What is smart metering, and how is it used in CPS-based manufacturing? What are some examples of smart metering applications in industry?	**07**

****