Reg. No.:

Name :

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TERM END EXAMINATIONS (TEE) – December 2023 – January 2024					
Programme	**:**	**B.Tech.**	**Semester**	**:**	**Interim 2023-24**
Course Title	**:**	**Cyber Physical Systems**	**Course Code**	**:**	**CSD3010**
			Slot	**:**	**A11+A12**
Time	**:**	**1½ hours**	**Max. Marks**	**:**	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
		PART - A (30 Marks)	
1	(a)	What distinguishes Cyber-Physical Systems (CPS) from traditional embedded systems, and how do CPS integrate computing, communication, and physical processes?	10
		OR	
	(b)	What are the recent advancements and challenges in integrating Cyber-Physical Systems (CPS) within manufacturing processes?	10
2	(a)	Explain the process of designing a robust Cyber-Physical Systems (CPS) architecture.	10
		OR	
	(b)	Explain the significance of Machine Learning in Data Analytics. Provide examples of supervised and unsupervised learning techniques and discuss how they contribute to extracting meaningful insights from large datasets.	10
3	(a)	Discuss the importance of Visualization Tools in Data Analytics. Describe popular visualization techniques and tools used to represent complex data sets effectively.	10
		OR	
	(b)	Discuss the significance and key characteristics of Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA).	10
		PART - B (20 Marks)	
4		Explain the significance of Lyapunov stability in the context of Cyber-Physical Systems. How does it relate to continuous dynamics, ensuring stability and robustness in the face of perturbations?	10
5		Briefly discuss the vulnerabilities and specific security challenges faced by CPS environments, emphasizing the complexities arising from the integration of cyber and physical components.	10