

Model Question Paper

Seventh Semester BE Degree Examination

IoT for Automation

Time: 3 Hours (180 Minutes)

Max. Marks: 100

**Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.**

Module -1			M	L	C
Q1	a.	Explain the concept of a Local Cloud in automation systems. Discuss its key properties and the steps involved in establishing a Local Cloud.	10	L2	CO1
	b.	Describe how automation support and automation application engineering are carried out in Local Clouds. What role does latency play in this environment?	10	L2	CO1
OR					
Q2	a.	Discuss the security challenges in Local Clouds and explain the concept of System of Systems (SoS) Scalability.	10	L2	CO1
	b.	With a neat architecture diagram, explain the Arrow Head Framework. Describe its documentation structure and the important definitions associated with it.	10	L2	CO1
Module- 2					
Q3	a.	Explain the Service Registry system and Authorization system in the Arrowhead Framework, highlighting their roles in secure service interaction.	10	L2	CO2
	b.	Describe the Orchestration system in detail. How does it help in managing communication between IoT automation systems?	10	L2	CO2
OR					
Q4	a.	Explain the Plant Description system and Configuration system with their functions in an Arrowhead-based automation environment.	10	L2	CO2
	b.	Discuss System Discovery and Device Discovery services in the Arrowhead Framework. Why are these services important for automation support?	10	L2	CO2
Module – 3					
Q5	a.	Explain the Component-based Engineering Methodology used in the design of IoT automation systems, with suitable examples.	10	L2	CO3
	b.	Discuss the safety and security engineering considerations that must be addressed while designing IoT automation systems.	10	L2	CO3
OR					
Q6	a.	Explain the process of Swift Deployment and Configuration in IoT automation systems and its advantages.	10	L2	CO3
	b.	Describe the procedures involved in PLC device monitoring and the replacement of a device in an IoT automation environment.	10	L2	CO3
Module – 4					
Q7	a.	Explain the concept of "Market as an Energy Optimizing Method" and describe how it helps improve energy efficiency in automation systems.	10	L2	CO4
	b.	Discuss optimization techniques based on a Virtual Market of Energy with a suitable example.	10	L2	CO4
OR					

Q8	a.	Explain the application of energy optimization on lifts. How does this improve overall system efficiency?	10	L2	CO4
	b.	Describe the concepts of Context Aware Streets and Optimization of Municipal Service Systems, giving relevant examples.	10	L2	CO4
Module – 5					
Q9	a.	Explain the role of Electric Vehicles and Recharge Infrastructure in complex automation systems. Discuss the Arrowhead SOA Energy Management (EM) Solution.	10	L2	CO5
	b.	Describe the Systems and Services involved in Arrowhead EM, along with related automation aspects.	10	L2	CO5
OR					
Q10	a.	Explain the Smart Maintenance Use Case along with the Co-simulation Platform used for complex systems management.	10	L2	CO5
	b.	Discuss the Authentication and Certification Service in Arrowhead systems. How is Safety and Security Analysis carried out to identify system vulnerabilities?	10	L2	CO5
