Reg. No.																

Question Paper Code	14178

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Sixth Semester

Mechanical and Automation Engineering

20MUPC603 - INDUSTRIAL AUTOMATION FOR MANUFACTURING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The three basic elements of an automated system are: (a) Sensors, actuators, controller (b) Processor, display, interface (c) Robot, tool, workpiece (d) Operator, computer, feedback	1	K1	CO1
2.	Buffers in automated flow lines help to: (a) Increase operator speed (b) Reduce machine downtime (c) Increase cycle time (d) Remove flexibility	1	K1	CO1
3.	The Master Production Schedule (MPS) defines: (a) Resource allocation (b) Machine layout (c) Product quantities and timing (d) Operator duties	1	K1	CO2
4.	GPSS is a: (a) Machine (b) Simulation language (c) CAD tool (d) Robot	1	K1	CO2
5.	Hollier method helps in: (a) Process scheduling (b) Machine arrangement (c) Tool design (d) Assembly planning	1	K1	CO3
6.	Single-station assembly machines are best for: (a) Batch production (b) Small-scale assembly (c) Mass assembly (d) Multi-product flow	1	K1	CO3
7.	RTU in SCADA means: (a) Remote Terminal Unit (b) Real-Time Utility (c) Remote Transfer Unit (d) Reliable Testing Unit	1	K1	CO4
8.	Transport automation deals with: (a) Personnel transport (b) Material transport in industries (c) Road vehicles (d) Data transfer	1	K1	CO4
9.	The function of LCU is to: (a) Supervise entire plant (b) Control local processes (c) Manage production planning (d) Collect marketing data	1	K1	CO5
10.	Security design in LCU architecture ensures: (a) Energy saving (b) Protection from data and control failures (c) Increased downtime (d) Manual override	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Define a production system and give an example.	2	K1	CO1
12.	List various levels in automation.	2	K1	CO1
13.	What is process planning?	2	K1	CO2
14.	Mention the difficulties in GPSS simulation.	2	K1	CO2
15.	What is Cellular Manufacturing?	2	K1	CO3
16.	What is meant by automated assembly?	2	K1	CO3
17.	Define Distributed Control System (DCS).	2	K1	CO4
18.	List the applications of SCADA.	2	K1	CO4

19.	Differentiate between centralized and distributed control systems.	2	K2	CO5
20.	Recall the importance of data analytics in process automation.	2	K1	CO5
21.	How does SCADA help in evacuation processes?	2	K1	CO4
22.	Mention the steps in building a simulation model.	2	K1	CO2

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Demonstrate the principles and strategies of automation in manufacturing systems.	11	K2	CO1
		OR			
	b)	Summarize various types of transfer mechanism used in automation system.	11	K2	CO1
24.	a)	Illustrate the various approaches of computer aided process planning.	11	K2	CO2
		OR			
	b)	Explain the classification of simulation language and their advantages and disadvantages.	11	K2	CO2
25.	a)	Identify the concept of part families and discuss different methods used for part classification and coding.	11	K3	CO3
		OR			
	b)	Construct the architecture of an FMS with a flowchart showing various operations involved.	11	K3	CO3
26.	a)	Develop various modules for a SCADA system and explain with neat schematic diagram.	11	K3	CO4
		OR			
	b)	Apply the role of SCADA in monitoring and controlling pumping stations and leak-flow studies.	11	K3	CO4
27.	a)	Draw and explain the architecture of a Distributed Control System (DCS). Describe the function of each block.	11	K2	CO5
		OR			
	b)	Explain the following with respect to their features and industrial applications. (i) Profibus, (ii) Fieldbus, and (iii) HART protocols	11	K2	CO5
28.	a)	Develop the cellular manufacturing system used in Group Technology.	11	K3	CO3
		OR			
	b)	Apply the performance of single-station and multi-station automated assembly machines.	11	K3	CO3