U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 22ME6PECIM **Max Marks: 100**
Course: Computer Integrated Manufacturing

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	List and explain the ten strategies for automation and process improvement.	CO1	PO1	**10**
	b)	Explain any 5 Hard-ware components required for CIM and process control.	CO1	PO1	**10**
		OR			
2	a)	List the primary manufacturing operations that are typically integrated within a Computer-Integrated Manufacturing (CIM) system.	CO1	PO1	**10**
	b)	Discuss the role and integration of Production Facilities in Computer-Integrated Manufacturing.	CO2	PO1	**10**
		UNIT - II			
3	a)	Explain the different vehicle guidance technology used in AGVs.	CO1	PO1	**10**
	b)	Explain i) Continuous ii) Intermittent iii) Asynchronous types of work transport system.	CO1	PO1	**10**
		OR			
4	a)	Discuss the need of vehicle safety in material transport systems and list any five applications of AGVs.	CO1	PO1	**10**
	b)	Explain the working of Geneva wheel mechanism with sketch.	CO1	PO1	**10**
		UNIT - III			
5	a)	Explain the following terms associated with Line Balancing i) Minimum rational work element ii) Balance delay	CO1	PO1	**08**
	b)	In a plant, a product is to be assembled as per the following information.	CO1	PO1	**12**

			<table><tr><th>Elements</th><th>Time (te) min</th><th>Immediate predecessor</th></tr><tr><td>1</td><td>5</td><td>-</td></tr><tr><td>2</td><td>3</td><td>1</td></tr><tr><td>3</td><td>8</td><td>1</td></tr><tr><td>4</td><td>2</td><td>2</td></tr><tr><td>5</td><td>1</td><td>2</td></tr><tr><td>6</td><td>6</td><td>3</td></tr><tr><td>7</td><td>4</td><td>4, 5</td></tr><tr><td>8</td><td>5</td><td>3, 5</td></tr><tr><td>9</td><td>3</td><td>7, 8</td></tr><tr><td>10</td><td>6</td><td>6, 9</td></tr></table> i) Construct the precedence diagram. ii) If the cycle time is 10 minutes, what is the number of stations required? iii) Assign the work elements to workstations using Largest candidate rule and Compute the balance delay of the line.			
			OR			
	6	a)	The following data applies to a 20-station inline transfer machine P=0.01, Tc=0.6 min, Td= 9 min. Using upper bound approach compute i) Ideal production rate ii) Frequency of line stop iii) Actual production rate iv) Line efficiency.	*CO2*	*PO1*	**10**
		b)	Explain the terms i) Starving ii) Blocking.	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	Explain any two placement and escapement devices used in automated assembly systems with sketches.	*CO2*	*PO1*	**10**
		b)	Explain i) Aggregate Production plan ii) Master Production schedule	*CO2*	*PO1*	**10**
			OR			
	8	a)	With a neat sketch, explain any two types of automated assembly systems.	*CO3*	*PO1*	**10**
		b)	With the help of flow chart, explain general procedure for using Retrieval CAPP system.	*CO3*	*PO1*	**10**
			UNIT - V			
	9	a)	Differentiate between Inspection and Testing.	*CO3*	*PO1*	**10**
		b)	Discuss the Pros and cons of Sampling Inspection.	*CO3*	*PO1*	**10**
			OR			
	10	a)	Define the primary purpose of inspection in a manufacturing process and List three common types of defects that inspection aims to identify. Briefly explain.	*CO1*	*PO1*	**10**

		b)	What is the key difference between acceptance sampling and process control sampling? Illustrate with an example how a defect found during final inspection can be more costly than one found earlier in the production process	*CO2*	*PO1*	**10**

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