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

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E.   **Semester: VI**
Branch: Mechanical Engineering   **Duration: 3 hrs.**
Course Code: 20ME6DECIM   **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.

				CO	PO	Marks
			UNIT - I			
1	a)		Define automation. Explain the three types of Automation	CO1	PO3	**10**
	b)		What are the benefits of automation? explain in detail	CO1	PO2 PO3	**10**
			UNIT - II			
2	a)		With a neat sketch explain Linear Walking beam mechanism process.	CO2	PO1 PO5	**10**
	b)		Explain the following transfer mechanisms with neat sketches (i) Ratchet & Pawl Mechanism (ii) Geneva Wheel Mechanism	CO2	PO1 PO5	**10**
			UNIT - III			
3	a)		Briefly explain partial automation in a flow line and manual assembly line	CO3	PO2 PO3	**10**
	b)		With example upper bound and lower bound approaches to analyse automated flow line without storage buffer.	CO3	PO1 PO2	**10**
			OR			
4	a)		A company has a partially automated 10 stations assembly line of which 4 are manually operated and 6 are automatic systems. One of the manual stations is the bottleneck stations. It is proposed to change this manual stations into automatic station. The current cycle time is 1 min and it is expected that changing the manual station to automatic station would reduce the cycle time to 0.8 min. The new station to be added would cost for operation at Rs. 25/min. The other cost data for the existing assembly line is: Cost of operating manual station, C_m= Rs. 15/min Cost of operating automatic station, C_{as} = Rs. 10/min. Cost of operating the transfer line, C_{at} = Rs. 12/min.	CO3	PO2 PO4	**12**

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.

			The probability of breakdown at each automatic workstations is p = 0.01. The average time per breakdown is 3 min. The value of p for new automatic machine is 0.02. Change in downtime is not expected. The cost of material is Rs. 50/unit, and the cost of tooling is Rs. 20/ unit. Compare the current line with the proposed change, on the basis of production rate and cost per piece. Assume a yield of 100% good product.			
	b)		Explain the process of computerized line balancing.	CO3	PO3 PO4	**08**
			UNIT - IV			
5	a)		Explain with sketches, various elements of a parts delivery system.	CO4	PO3 PO4	**10**
	b)		Explain the types of automated assembly system.	CO4	PO3 PO4	**10**
			OR			
6	a)		Explain the analysis of multi station assembly machine.	CO4	PO4	**10**
	b)		With a block diagram explain fundamental concept in MRP systems.	CO4	PO3 PO4	**10**
			UNIT - V			
7	a)		With a neat sketch explain the configurations of robot.	CO5	PO3 PO5	**10**
	b)		Explain the joints in robot With a suitable sketch.	CO5	PO3 PO5	**10**

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