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

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E.

Branch: Mechanical Engineering

Course Code: 20ME6DECIM

Course: Computer Integrated Manufacturing

Semester: VI

Duration: 3 hrs.

Max Marks: 100

Date: 19.07.2023

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)	Define automation. Explain different types of automation.	CO1	PO1	10
		b)	Explain automation migration strategy with a neat sketch.	CO1	PO1	10
			UNIT - II			
	2	a)	Explain the following transfer mechanisms with neat sketches. (i) Rack & Pinion Mechanism. (ii) Geneva Wheel Mechanism	CO1	PO1	10
		b)	List and elaborate the methods of work transportation.	CO2	PO1	10
			UNIT - III			
	3	a)	A 20 station transfer line has an ideal cycle time of $T_c = 1.2$ mins. The probability of station breakdown per cycle is equal for all stations & $P = 0.005$ breakdowns / cycle. For each of the upper bound & lower bound determine: a) frequency of line stops per cycle b) average actual production rate c) line efficiency.	CO5	PO1,2	10
		b)	Explain the following terms using with storage buffer. (i) Zero buffer storage. (ii) Buffer storage with infinite capacity.	CO2	PO1,2	10
			OR			
	4	a)	A 20-station transfer line is divided into two stages of 10 stations each. The ideal cycle time of each stage is $T_c = 1.2$ min. All of the stations in the line have the same probability of stopping, $p = 0.005$. It is assumed that the downtime is constant when a breakdown occurs, $T_d = 8.0$ min. Using the upper-bound approach, compute the line efficiency for the following buffer capacities: (a) $b = 0$, (b) $b = \infty$, (c) $b = 10$, (d) $b = 100$	CO5	PO1,2	10

	b)	A 30 station Transfer line is being proposed to machine a certain component currently produced by conventional methods. The proposal received from the machine tool builder states that the line will operate at a production rate of 100 pc / hr at 100% efficiency. From a similar transfer line, it is estimated that breakdowns of all types will occur at a frequency of $F = 0.20$ breakdowns per cycle & that the average downtime per line stop will be 8.0 minutes. The starting blank that is machined on the line costs Rs. 5.00 per part. The line operates at a cost for 100 parts each & the average cost per tool = Rs. 20 per cutting edge. Compute the following: 1. Production rate 2. Line efficiency 3. Cost per unit piece produced on the line.	CO5	PO1,2	10
		UNIT - IV			
5	a)	Explain parts feeding and delivery system with neat sketches.	CO3	PO1	10
	b)	Explain any three types of AGV's with neat sketches.	CO1	PO1	10
		OR			
6	a)	Explain the structure of MRP system with block diagram.	CO3	PO1	10
	b)	Explain design for automated assembly.	CO1	PO1	10
		UNIT - V			
7	a)	Explain four basic configurations of industrial robot with neat sketches.	CO3	PO1	10
	b)	Explain steps in part programming with neat block diagram.	CO4	PO1	10
