GUJARAT TECHNOLOGICAL UNIVERSITY
ME – SEMESTER – II (New)– EXAMINATION – WINTER-2019

Subject Code: 3720815   **Date: 20-11-2019**
Subject Name: Computer Integrated Manufacturing
Time: 02:30 PM TO 05:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the basic elements of an automated system. What are the nature and roles of the components of CIM system?	**07**
	(b)	Explain the need of CAPP. Differentiate between its types.	**07**
Q.2	**(a)**	Explain Line pacing for Manual Assembly line.	**07**
	(b)	Explain (i) Continuous transport (ii) Synchronous Transport (iii) Asynchronous transport with suitable examples.	**07**

<div align="center">OR</div>

	(b)	Explain Ranked Positional weight method for line balancing problem. How does it differ from Kilbridge and Wester Method?	**07**
Q.3	**(a)**	Using neat sketches, explain the physical configurations of an automated assembly system.	**07**
	(b)	Discuss the three basic principles to be considered while designing a Recirculating conveyor system. A recirculating conveyor has a total length of 300 m. Its speed is 60 m/min. and the spacing of part carriers along its length is 12 m. Each carrier can hold two parts. The task time required to load two parts into each carrier is 0.20 min and the unload time is the same, The required loading and unloading rates are both defined by the specified flow rate, which is 4 parts/min, Evaluate the conveyor system design with respect to Kwo's three principles.	**07**

<div align="center">OR</div>

Q.3	**(a)**	Explain the technologies utilized for guiding the material transport vehicles in an industry.	**07**
	(b)	Discuss the Machine Vision technique for inspection of parts.	**07**
Q.4	**(a)**	Explain AGV and its types. Also discuss the importance of AS/RS in an industry.	**07**
	(b)	Discuss the types of conveyor systems used for material handling.	**07**

<div align="center">OR</div>

Q.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, $p = 0.005$. Assume 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: (i) b = 0, (ii) b = ∞, (iii) b = 10 and (iv) b = 100. Also compute the production rates for all four cases.	**07**
	(b)	Discuss the automatic data capture technologies and explain any one of them in detail.	**07**
Q.5	**(a)**	Explain the types of flexibilities in FMS and discuss the factors on which these flexibilities depend.	**07**
	(b)	Discuss the operational issues to be handled in a Flexible Manufacturing system.	**07**

<div align="center">OR</div>

Q.5	**(a)**	Classify rapid prototyping process.	**07**
	(b)	Differentiate between SLS and SLA in rapid prototyping.	**07**

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