



USN

USN registration box with 10 empty cells

10ME61

Sixth Semester B.E. Degree Examination, June/July 2019

Computer Integrated Manufacturing

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Define automation. Briefly explain different types of automation. (10 Marks)
b. What are the reasons for automation? (02 Marks)
c. Explain the following terms:
i) Manufacturing lead time ii) Production rate
iii) Production capacity iv) Utilization and availability (08 Marks)
2 a. What do you mean by automated flow line? Classify and explain the automated flow line system configuration. (10 Marks)
b. Sketch and explain the following transfer mechanisms:
i) Walking beam transfer mechanism
ii) Geneva wheel mechanism (10 Marks)
3 a. Explain the upper bound approach and lower bound approach in analyzing automated flow line without storage buffer. (08 Marks)
b. The following data applied to a 12-station In-line transfer machine. P = 0.01 (All station have an equal probability of failure)
Tc = 0.3 min
Td = 3 min
Using upper bound and lower bound approaches compute the following for the transfer machine:
i) The frequency of line stops
ii) The average production rate
iii) The line efficiency (08 Marks)
c. What is mean by storage buffer? Mention two extreme cases of storage buffer effectiveness. (04 Marks)
4 a. Explain the following terms in line balancing:
i) Minimum rotational work element ii) Precedence diagram
iii) Cycle time iv) Balance delay (08 Marks)
b. The following list defines the precedence relationships and element times for a new model toy.

Table with 11 columns: Element, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Rows: Time 'Te' min, Immediate predecessors

Using largest candidate rule method:

- i) Construct the precedence diagram
ii) If the ideal cycle time is to be 1 min what is the minimum number of workstations required?
iii) Calculate the balance delay. (12 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



10ME61

**PART – B**

- 5 a. Explain with sketches, the elements of the parts delivery system for an automated assembly line. (10 Marks)
- b. List the principles used in product design for automated assembly. (05 Marks)
- c. What is an automated guided vehicle system? List the applications of AGVS. (05 Marks)
- 6 a. Briefly explain:  
i) Retrieval CAPP system  
ii) Generative CAPP system (10 Marks)
- b. What is material requirement planning? Explain the structure of a MRP system. (10 Marks)
- 7 a. Describe salient features of CNC system along with a block diagram. (10 Marks)
- b. Discuss the advantages, disadvantages and application of CNC machines. (10 Marks)
- 8 a. With neat figures, briefly explain the common robot configurations. (12 Marks)
- b. Briefly explain the end effectors and sensors with respect to robots. (08 Marks)

\* \* \* \* \*