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Sixth Semester B.E. Degree Examination, June/July 2016
Computer Integrated Manufacturing

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART - A

- 1 a. What are the different reasons for industrial automation? How do you classify automated manufacturing systems? List typical features of them. (12 Marks)
- b. A part is produced in a batch size of 100 units. 5 operations are required to complete the processing of the part. Average setup time is 3 hours/operation, average operation time is 0.1 hour. Delay, inspection time & others account to 7 hours for each operation. Determine how many days are required to complete the batch, assuming the plant runs 8 hours shift per day. (05 Marks)
- c. Define MLT, utilization and availability. (03 Marks)
- 2 a. With a neat sketch, explain the configuration of an automated flow line. What are the different symbols and notations practiced in production systems? (08 Marks)
- b. Explain with neat diagram the working principle of walking beam system. (08 Marks)
- c. What are the different controlling functions of an automated flow line? Explain. (04 Marks)
- 3 a. Explain the following :
i) Upper bound approach and lower bound approach
ii) Starting and Blocking of stations (08 Marks)
- b. A line has 10 workstations, each with a probability of breakdown 0.02. The cycle time of line is 60 seconds and each time breakdown occurs, it takes 5 minutes to repair. The line is divided into two stages by a buffer storage. Each stage consists of 5 stations. Compute efficiency of the line with no buffer storage capacity and efficiency for two stage flow lines. (10 Marks)
- c. What are the factors affecting line balancing? (02 Marks)
- 4 a. Write a short note on the following :
i) Precedence constraints & precedence diagram ii) Line efficiency iii) Balance delay. (08 Marks)
- b. The demand of the assembly line with its elemental time and precedence is as given below. Construct the precedence diagram and find balance delay by Kilbridge and Wester's method. (Cycle time = 1.5 minute) (12 Marks)

Elements	Time (Minutes)	Immediate Predecessor
1	1	-
2	0.5	-
3	0.8	1, 2
4	0.3	2
5	1.2	3
6	0.2	3, 4
7	0.5	5
8	1.5	5, 6, 7

PART – B

- 5 a. With neat sketch, explain part feeding and delivery systems. (10 Marks)
b. Briefly explain different types of vehicle guiding systems used for AGVs. (10 Marks)
- 6 a. With a neat diagram, explain generative and retrieval CAPP systems. (12 Marks)
b. Define MRP process inputs and outputs. What do you mean by BOM? (08 Marks)
- 7 a. Give general configuration of a CNC system. List various advantages and disadvantages of CNC machining centers. (08 Marks)
b. Discuss various types of NC co-ordinate systems along with motion control systems. (10 Marks)
c. Describe the following codes:
i) G₀₀ ii) G₉₀ iii) G₀₂ iv) G₀₄ (02 Marks)
- 8 a. Define Industrial Robot. Enlist the different applications of Robot. (06 Marks)
b. How do you specify a robot? (04 Marks)
c. Explain with neat sketches different types of end-effectors, sensors used in robot. (10 Marks)
