USN | | | | | | | | | | |

06ME72

Seventh Semester B.E. Degree Examination, June/July 2011
Computer Integrated Manufacturing

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. Draw sketches wherever necessary.

PART – A

1 a. Define Automation? Briefly explain with one example each of different types of automation. **(08 Marks)**

b. Explain the following terms related to manufacturing: i) Utilization & Availability. ii) W/P & T/P ratio. iii) Production rate & MLT. **(06 Marks)**

c. The average part produced in a certain batch manufacturing plant must be processed through an average of the machines. There are 20 new batches parts launched each week. Data for the above problem are;
Average operation time : 6min
Average setup time : 5 hours
Average batch size : 25 parts
Average non-operation time per batch : 10 hours
There are 18 machines in the plant. The plant operates an average of 70 production hours per week. Scrap rate is neglizable
i) Determine the manufacturing lead time.
ii) Plant capacity.
iii) Plant utilization. **(06 Marks)**

2 a. Explain the various methods of work part transport in an automated flow line. **(08 Marks)**

b. Explain with sketches the following transfer machines used for the automated flow lines.
i) Linear transfer mechanism. ii) Rotary transfer mechanism. **(12 Marks)**

3 a. Using the lower bound approach analyze the transfer lines without storage and with storage buffers. **(10 Marks)**

b. With suitable assumptions, determine the line performance for the single stage, two stage & three stage cases.

Station	P_i	Station	P_i
1	0.01	9	0.03
2	0.02	10	0.01
3	0.01	11	0.02
4	0.03	12	0.02
5	0.02	13	0.02
6	0.04	14	0.01
7	0.01	15	0.03
8	0.01	16	0.01

(10 Marks)

4 a. With suitable terminology, explain following terms related to line balancing problems.
i) Minimum Rational work element ii) Workstation process time iii) Precedence constraint & diagram iv) Balance delay. **(12 Marks)**

b. Explain with an example, any one method of line balancing. **(08 Marks)**

PART – B

5 a. Explain with sketches, the various elements of a parts delivery system. **(10 Marks)**

b. Analyse the multi station assembly machine with suitable assumption and parameters. **(06 Marks)**

c. Explain briefly i) The vehicle guidance and routing system. ii) traffic control & safety related to automated guided vehicles(AVG's). **(04 Marks)**

6 a. Explain the following two approaches designed for the computer aided process planning system i) Retrieval CAPP system. ii) Generative CAPP system. **(12 Marks)**

b. What is a material requirement planning? Explain the various inputs to the MRP system. **(08 Marks)**

7 a. Explain with a block diagram, the general configuration of a computer numerical control system (CNC). **(10 Marks)**

b. Explain the fundamental steps involved in development of part programming for milling and turning. **(10 Marks)**

8 a. Explain with sketches, the common robot configurations. **(10 Marks)**

b. Explain the different methods of programming a robot. **(08 Marks)**

c. List the various types of sensors used for the robot? **(02 Marks)**

* * * * *