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10ME61

Sixth Semester B.E. Degree Examination, June/July 2015
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. Define Automation. Explain the different types of automation. (08 Marks)
 b. Explain the following automation strategies : (04 Marks)
 i) Specialization of operator ii) Online Inspection.
 c. The parts produced in a certain batch has to be processed through an average of 6 machines. There are 20 new batches of parts launched each week. Other data as follows :
 i) Average operation time = 0.1 Hr ; ii) Average setup time = 5 Hr ;
 iii) Average non – operation time = 10 Hr ; iv) Average Batch size = 25 parts.
 There are 18 work centers in the plant and the plant operates for an average of 70 production Hr/week. Determine i) Manufacturing lead time ii) Plant capacity
 iii) Production rate iv) Plant utilization. (08 Marks)
- 2 a. Explain Synchronous transfer method and Asynchronous transfer method of work transport in automation. (08 Marks)
 b. Explain with neat sketches, the following transfer mechanisms : (12 Marks)
 i) Walking beam transfer bar system ii) Geneva mechanism.
- 3 Explain the following related to analysis of an automated flow lines : (20 Marks)
 a. Partial automation.
 b. Lower bound approach.
 c. Upper bound approach.
 d. Effect of storage.
- 4 a. Explain the following terms related to line balancing : (06 Marks)
 i) Total work context time ii) Assembly line balance iii) Line balancing.
 b. The table below defines the precedence relationships and elements times for a new model :
 i) Construct the precedence diagram
 ii) If the Ideal time = 1 min
 iii) Use Kilsridge and Westers method to assign the work station to each element and compute the balance delay and line efficiency. (14 Marks)

Work element	1	2	3	4	5	6	7	8	9	10	11	12
Te(min)	0.25	0.45	0.35	0.4	0.32	0.2	0.27	0.7	0.6	0.38	0.5	0.43
Preceded by	-	1	1	1	2	2,3	4	4	5	6,7	8	9,10,11

PART – B

- 5 a. List the principles used in product design for automated assembly. (06 Marks)
 b. With a neat sketch, explain elements of parts delivery system. (08 Marks)
 c. Define AGVS. List the advantages and applications of AGVS. (06 Marks)



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- 6 a. With a block diagram, explain variant CADD system. (10 Marks)
b. What is Material requirement? Explain the structure of a MRP system. (10 Marks)
- 7 a. Discuss the advantages and disadvantages of CNC systems. (10 Marks)
b. Explain the fundamental steps involved in part programming for turning and milling. (10 Marks)
- 8 a. Explain the different configuration of robot, with neat sketches. (12 Marks)
b. Explain the following terms related to robots : (08 Marks)
i) End effectors ii) Programming methods.
