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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 :
 - i) Specialization of operator ii) Online Inspection. (04 Marks)
 - 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 :
 - i) Walking beam transfer bar system ii) Geneva mechanism. (12 Marks)
- 3 Explain the following related to analysis of an automated flow lines :
 - a. Partial automation.
 - b. Lower bound approach.
 - c. Upper bound approach.
 - d. Effect of storage. (20 Marks)
- 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)

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|--------------|------|------|------|-----|------|-----|------|-----|-----|------|-----|---------|
| 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)

- 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.
