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Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. What is automation? Explain different types of automation. **(08 Marks)**
   b. Explain the following terms:
      i) Manufacturing lead time   ii) Production rate   iii) Production capacity   **(06 Marks)**
   c. In a manufacturing plant a part is produced in a batch size of 60 units. The batch must be routed through 8 operations to complete it. Average set up time 5 hr/operation. Average operation time is 10 min. Average non-operation time is 7 hrs/operation. Determine:
      i) Manufacturing lead time in number of days of the plant runs 8 hrs shift/day.
      ii) Production rate of the plant.   **(06 Marks)**

2 a. Explain the various methods of work part transport in an automated flow line. **(09 Marks)**
   b. What are the symbols used in an automated flow line? **(05 Marks)**
   c. Sketch and explain the linear walking beam mechanism. **(06 Marks)**

3 a. Explain the upper bound approach and lower bound approach in analyzing transfer lines, without storage buffer. **(08 Marks)**
   b. Discuss the starving and blocking of stations with respect to an automated flow line. **(04 Marks)**
   c. The ideal cycle time of an 16 station transfer line is 1.4 min. The average down time per line will be 6 min and the probability of breakdowns per cycle is equal for all cycles and is equal to 0.004. Determine production rate and line efficiency by considering both upper bound and lower bound approaches. **(08 Marks)**

4 a. Explain the following terms with respect to line balancing:
      i)   Cycle time   ii) Precedence constraints
      iii) Precedence diagram   iv) Balance delay   **(08 Marks)**
   b. What are the objectives of line balancing? **(06 Marks)**
   c. Explain with an example, the largest candidate rule method of line balancing. **(06 Marks)**

PART – B

5 a. Discuss the principles used in product design to facilitate automated assembly. **(06 Marks)**
   b. With neat figures, explain the elements of part delivery system. **(06 Marks)**
   c. Discuss the functions that are performed while operating AGVS. **(08 Marks)**

6 a. With the help of a block diagram, explain retrieval CAPP systems. **(08 Marks)**
   b. Explain the structure of MRP system. **(08 Marks)**
   c. Briefly explain the capacity planning. **(04 Marks)**

7 a. Describe salient features of CNC systems. **(10 Marks)**
   b. Discuss the advantages and disadvantages of CNC systems. **(10 Marks)**

8 a. With neat sketches, discuss the common robot configurations. **(12 Marks)**
   b. Explain resolution, accuracy and repeatability, as applied to robot. **(08 Marks)**

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