Sixth Semester B.E. Degree Examination, June/July 2018
Computer Integrated Manufacturing

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO full questions from each part.

PART – A

1. a. Define Manufacturing Lead Time (MLT). How is it computed for batch production and job shop situations? **(06 Marks)**

   b. Sketch and explain the model showing information processing activities required for a typical manufacturing firm. **(06 Marks)**

   c. A part is processed in a batch production plant must be processed through average of 6 machines. There are 20 new batches of parts launched each week.
   Given:

Average operation time	= 6 min
Average setup time/batch	= 5 hr,
Average batch size	= 25 parts,
Average non operation time/batch	= 10 hr,
Number of machines in the plant	= 18, and

   Plant operates average of 70 hours/week,
   Determine:
   i) Manufacturing lead time.
   ii) Plant capacity.
   iii) Plant utilization and
   iv) Work in process. **(08 Marks)**

2. a. What are pallet fixtures? Discuss the advantages and applications of pallet fixtures in automated flow lines. **(06 Marks)**

   b. Distinguish between synchronous and asynchronous methods of transfer of work parts in flow lines. What are their relative advantages and applications? **(06 Marks)**

   c. List and explain control functions used in an automated flow line. **(08 Marks)**

3. a. Explain with examples upper bound and lower bound approaches used to analyze the transfer lines. Derive appropriate relations to compute frequency of line stops in above approaches. **(12 Marks)**

   b. Discuss the problems faced by flow lines without work part storage buffers and how it is minimized by storage buffer. **(08 Marks)**

4. a. Briefly explain the following terms in line balancing:
   i) Zoning constraint
   ii) Precedence constraint
   iii) Total work content
   iv) Minimum rational work element. **(08 Marks)**

b. The following table defines the precedence relationships and element times:

Element	1	2	3	4	5	6	7	8
Time (min)	10	5	8	3	12	2	5	15
Immediate predecessor	-	-	1, 2	2	3	3, 4	4	5, 6, 7

Using Ranked positional weights method.
i) Construct precedence diagram and compute RPW.
ii) Assign work elements to stations considering ideal cycle time of 15 mins.
iii) Calculate balance delay. **(12 Marks)**

PART – B

5 a. With neat sketches, explain horizontal and vertical part placement devices used in dial indexing table. **(08 Marks)**
   b. What are AGVs? Explain various types of AGVs and their applications. **(12 Marks)**

6 a. With the help of a diagram explain the working of retrieval type CAPP system. How is it different from generative CAPP approach? **(10 Marks)**
   b. With the help of a block diagram of structure of MRP system, explain the working of material requirement planning system. Also discuss the benefits of computerized MRP system. **(10 Marks)**

7 a. Distinguish between the following with respect to CNC systems:
   i) Absolute and incremental coordinates.
   ii) Fixed zero and floating zero.
   iii) Contouring and straight cut CNC systems.
   iv) Closed loop and open loop CNC systems. **(08 Marks)**
   b. Prepare a manual part program to machine the profile of the part shown below. Assume suitable machining parameters.
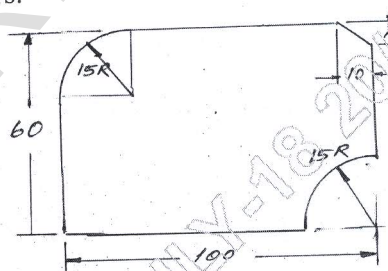
[All dimensions are in mm]
Fig.Q.7(b)

Program should be complete in all respects. Add comments at the end of each block. (Plate thickness is 15mm). **(12 Marks)**

8 a. With the help of a neat sketch. Illustrate six degrees of freedom of a polar Robot. **(06 Marks)**
   b. Distinguish between:
   i) Walk through and lead through programming.
   ii) MCL and VAL programming of Robot. **(08 Marks)**
   c. Discuss the Robot applications in ARC welding. **(06 Marks)**

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