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10ME61

Sixth Semester B.E. Degree Examination, June/July 2017
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 and CIM with the aid of conceptual model of manufacturing. **(06 Marks)**

b. Briefly explain the various "Automation Strategies" that can be adopted to improve the productivity. **(10 Marks)**

c. Define the term plant capacity with a mathematical relation. **(04 Marks)**

2 a. The average part produced in a certain batch manufacturing plant must be processed through an average of 8 machines. 20 new batches are launched each week. Operating time is 8 min, average setup time is 8 hrs, batch size is 30 units, average non-operation time is 15 hr/machine. Number of machines available in the plant is 20. The plant operates on an average of 80 production hrs/week. Determine
(i) MLT (ii) R_P (iii) PC (iv) U (v) WIP (vi) WIP ratio (vii) TIP ratio. **(10 Marks)**

b. Illustrate the configuration of an automated flow line. **(04 Marks)**

c. With the aid of sketches, explain any two rotary transfer mechanisms. **(06 Marks)**

3 a. Analyze the flow line performance by means of three basic measures. **(06 Marks)**

b. Explain the limits of storage buffer effectiveness. **(04 Marks)**

c. A 20 station line is divided into 2 stages of 10 stations each. The ideal cycle time of each stage is 1.2 min. All the stations in the line have the same probability of stoppage equal to 0.005. When breakdown occurs, it takes an average of 8 min, using the upper bound approach, compute the flow line efficiency for the following buffer capacity
(i) b = 0, (ii) b = ∞, (iii) b = 10, (iv) b = 100. **(10 Marks)**

4 a. Write a note on: (i) Precedence diagram (ii) Minimum rational work element. **(04 Marks)**

b. Explain Kilbridge and Wester's method. **(06 Marks)**

c. The precedence relationships and element time for a new model toy are as follows:

Element	T_e min	Immediate precedence
1	0.5	-
2	0.3	1
3	0.8	1
4	0.2	2
5	0.1	2
6	0.6	3
7	0.4	4, 5
8	0.5	3, 5
9	0.3	7, 8
10	0.6	6, 9

Using largest candidate rule method, compute (i) Number of stations required (ii) Balance delay, if the ideal cycle time is 1.0 minute. **(10 Marks)**

PART – B

5 a. Indicate the classification of an automated assembly system. **(04 Marks)**

b. Illustrate the elements of part delivery system at an assembly station. **(08 Marks)**

c. List the types of AGV's and write a note on vehicle guidance technology adopted to AGV's. **(08 Marks)**

6 a. Indicate the benefits of CAPP and explain retrieval type CAPP. **(12 Marks)**

b. What are the inputs required for carrying out an efficient MRP? Explain. **(08 Marks)**

7 a. What are NC words? Explain. **(08 Marks)**

b. Differentiate between absolute and incremental coordinate system. **(04 Marks)**

c. Write a manual part program to drill 5 holes of ϕ15 mm for the shown part in Fig.Q7(c). The plate size is 100×100×20 mm. Assume suitable data. **(08 Marks)**

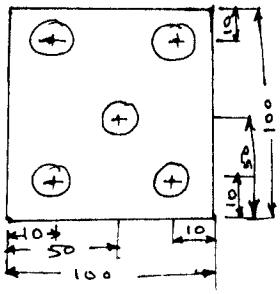

Fig.Q7(c)

8 a. With suitable sketches explain the different robot physical configurations. **(08 Marks)**

b. Explain the following :

(i) Robot anatomy

(ii) Precision of movement

(iii) Programming of robot. **(12 Marks)**

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