

# CBCS SCHEME

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15ME62

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

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. Define automation. Distinguish between fixed and programmable automation with examples. (08 Marks)
- b. State and explain the different reasons for automation. (08 Marks)

OR

- 2 a. Explain upper bound and lower bound approach with respect to automated transfer lines. (08 Marks)
- b. The average part produced in a certain batch manufacturing plant must be processed through an average of 8 machines, 15 new batches are launched each week. Operating time is 8 min, average set up time is 8 hours, batch size is 30 minutes, average non-operation time is 15 hrs/machine. Number of machines available in the plant is 20. The plant operates on an average of 80 production hrs/week. Determine (i) manufacturing lead time (ii) production rate (iii) plant utilization (iv) Work-in-process. (08 Marks)

### Module-2

- 3 a. State and explain the different steps in computer aided design process. (08 Marks)
- b. Explain the functions of a graphics package. (08 Marks)

OR

- 4 a. Define computer aided process planning. With a block diagram explain variant approach type of CAPP system. (08 Marks)
- b. What do you mean by material requirement planning (MRP)? What are MRP inputs and outputs? (08 Marks)

### Module-3

- 5 a. Define flexible manufacturing system? List and explain the different types of flexibility. (08 Marks)
- b. Explain in brief with diagram the structure of AS/RS system. What are the advantages of it? (08 Marks)

OR

- 6 a. Explain the terminology with formulas:  
(i) Minimum rational work element  
(ii) Cycle time (iii) Precedence constraints and precedence diagram. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- b. A project has the following tasks. Its immediate predecessor and task times are given below. Using largest candidate rule balance the line and determine
- (i) Number of work stations
  - (ii) Balance delay of line and
  - (iii) Line efficiency
- Take cycle time = 1 min.

Tasks	1	2	3	4	5	6	7	8	9	10	11	12
Preceded by	-	-	1	1, 2	2	3	3	3, 4	6, 7, 8	5, 8	9, 10	11
$T_e$ (min)	0.2	0.4	0.7	0.1	0.3	0.11	0.32	0.6	0.27	0.38	0.5	0.12

(10 Marks)

**Module-4**

- 7 a. With a sketch explain the classification of NC/CNC's system based on motion control systems. (09 Marks)
- b. Write a manual part programme for machining the profile as shown in the Fig.Q7(b)? (07 Marks)

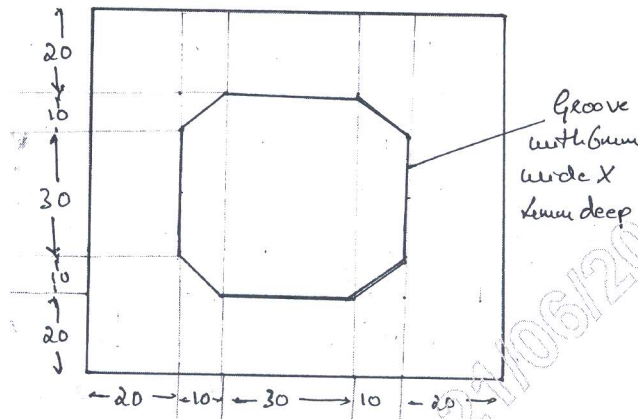


Fig.Q7(b)

OR

- 8 a. Explain with a neat sketch the robot configuration. (07 Marks)
- b. Explain briefly with diagram if necessary:
- (i) Slip sensors
  - (ii) Range sensors
  - (iii) Advantages and disadvantages. (09 Marks)

**Module-5**

- 9 a. Explain briefly the different steps involved in additive manufacturing system. (08 Marks)
- b. With a neat sketch, explain the working principle of selective laser sintering. Discuss the advantages for it. (08 Marks)

OR

- 10 a. Explain the components of Industry 4.0. (08 Marks)
- b. List and explain IOT applications in manufacturing. (08 Marks)

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