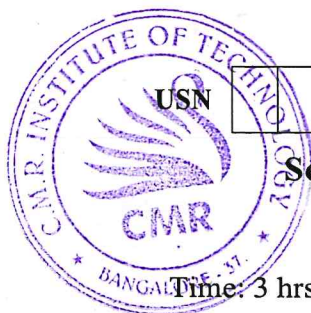


# CBCGS SCHEME



18ME72

--	--	--	--	--	--	--	--

**Seventh Semester B.E. Degree Examination, Feb./Mar. 2022**

## Computer Aided Design and Manufacturing

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Define Automation. Explain different types of automation. (10 Marks)
- b. The average part produced in a certain batch manufacturing plant must be processed through an average 6 machines. 20 new batches are launched each week. Average operation time is 6 mins average set-up time is 5 hrs, average batch-size is 25 parts, average non-operation time per batch is 10 hrs/machine. There are 18 machines in the plant. The plant operates an average of 70 production hours per week. Scrap rate is negligible, determine:
- (i) Manufacturing Load Time (MLT) for an average part      (ii) Production rate  
 (iii) Plant capacity      (iv) Plant utilization      (v) WIP (10 Marks)

OR

- 2 a. What is buffer storage? Explain types of buffer storage with neat sketch. (08 Marks)
- b. Define Upper bound approach and lower bound approach. (04 Marks)
- c. For a 10 station transfer line, refer following data:  
 $P = 0.01$  (all stations have an equal probability of failure)  
 $T_c = 0.5 \text{ min}$ ,       $T_d = 5.0 \text{ min}$   
 Using upper bound approach, determine: (i) The frequency of line stop  
 (ii) The average production rate      (iii) The line efficiency (08 Marks)

### Module-2

- 3 a. Explain with block diagram, the design process using Computer Aided Design (CAD). (10 Marks)
- b. Explain the different functions of graphics packages. (10 Marks)

OR

- 4 a. Explain in detail the Retrieval type of CAPP. (10 Marks)
- b. What is MRP? Explain the different inputs of MRP with block diagram. (10 Marks)

### Module-3

- 5 a. Briefly explain different types of manufacturing cells. (10 Marks)
- b. What is AS/RS? Explain different types of AS/RS. (10 Marks)

OR

- 6 a. By using the given information:  
 The product demand is 1800 units/week;      The industry works 48 hrs/week ;  
 Number of operators 8 ; Uptime of assembly is 94% ; There is no repositioning required  
 Determine: (i) Line efficiency      (ii) Balance delay      (iii) Smoothness index, by using  
 largest candidate rule method. The work elements and their times involved in the assembly  
 operation is as below:

Element	1	2	3	4	5	6	7	8
Tek (min)	1.0	0.5	0.8	0.3	1.2	0.2	0.5	1.5
Predecessor by	-	-	1, 2	2	3	3, 4	4	5, 6, 7

(14 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. Define and write the mathematical model of:
- (i) Total work content time ( $T_{wc}$ )
  - (ii) Cycle Time ( $T_c$ )
  - (iii) Smoothness Index (SI)

(06 Marks)

**Module-4**

- 7 a. Explain briefly the steps involved in the development of a part program. (10 Marks)  
b. List out the advantages, limitations and applications of CNC's. (10 Marks)

**OR**

- 8 a. Explain with neat sketches the different joints used in industrial robots. (10 Marks)  
b. Write a short note on robot programming methods. (10 Marks)

**Module-5**

- 9 a. Define additive manufacturing systems and list out its advantages, disadvantages and application. (10 Marks)  
b. With neat sketch, explain sheet lamination type AM process. (10 Marks)

**OR**

- 10 Write short notes on:
- a. Evolution of industry 4.0
  - b. Big data and cloud computing for IoT
  - c. Supply chain optimization
  - d. Cyber physical manufacturing systems
- (20 Marks)

\*\*\*\*\*