



CBCS SCHEME

15ME62

Sixth Semester B.E. Degree Examination, Aug./Sept.2020 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. List and explain different types of automation. (08 Marks)
- b. The average part produced in a certain batch manufacturing plant must be processed through an average of 6 machines. There are 20 new batches parts launched each week. Data for the average problem are as follows:
Average operation time = 6 min
Average setup time = 5 hrs
Average non-operation time = 10 hrs
Average batch size = 25 parts.
There are 18 machines in the plant. The plant operates an average of 70 hours/week. Scrap rate is negligible. Determine
(i) Manufacturing Lead Time (ii) Production rate (iii) Plant capacity (iv) Plant Utilization (08 Marks)

OR

- 2 a. Explain the following :
(i) Upper bound and lower bound approach.
(ii) Starving and blocking of stations. (08 Marks)
- b. What are the two reasons for partial automations analyse the performance of partial automation along with suitable assumptions. (08 Marks)

Module-2

- 3 a. With a block diagram, explain the phases of design and manufacturing process. (08 Marks)
- b. Explain the following :
(i) Translation (ii) Rotation (iii) Scaling (iv) Concatenation. (08 Marks)

OR

- 4 a. Define CAPP. With block diagram, explain generative type of CAPP system. (08 Marks)
- b. Explain the structure of MRP system. (08 Marks)

Module-3

- 5 a. Explain the components of flexible manufacturing system. (08 Marks)
- b. Discuss the benefits and limitations of Flexible Manufacturing System. (08 Marks)

OR

- 6 a. Define the following terms : (i) Minimum rational work element
(ii) Total work content
(iii) Balance delay. (06 Marks)

- b. In a plant, a product is to be assembled as per the following data:

Element	1	2	3	4	5	6	7	8	9	10
Time in mins (T_{ck})	5	3	8	2	1	6	4	5	3	6
Immediate precedence	-	1	1	2	2	3	4, 5	3, 5	7, 8	6, 9

- (i) Construct the precedence diagram.
 (ii) If the cycle time is 10 min, find the number of stations required.
 (iii) Compute the balance delay, smoothness index and line balance efficiency using largest candidate rule. (10 Marks)

Module-4

- 7 a. What are the elements of CNC system? List the salient features. (08 Marks)
 b. Explain the fundamental steps involved in CNC part programming of milling and drilling operations. (08 Marks)

OR

- 8 a. Sketch and explain the robot configurations. (12 Marks)
 b. Define : (i) Resolution (ii) Repeatability, as applied to robots. (04 Marks)

Module-5

- 9 a. Explain the advantages and applications of additive manufacturing. (08 Marks)
 b. Explain with a sketch, binder jetting process. (08 Marks)

OR

- 10 a. Discuss the Internet of Things (IoT) applications in manufacturing. (08 Marks)
 b. Explain the following : (08 Marks)
 (i) Big Data (ii) Cloud computing.
