DHANALAKSHMI COLLEGE OF ENGINEERING

ME 6703 – COMPUTER INTEGRATED MANUFACTURING

UNIT I – INTRODUCTION

Part – A

1. Define – CAD and CAM
2. List out the fundamental reason for implementing a CAD system.
3. Define – CIM
4. Write the types of production.
5. What is lean production?
6. Define – Production Capacity
7. Define – Utilization and Availability
8. Define – Manufacturing Lead Time
9. Define – Direct Labor, Material and Overhead Cost
10. Define – Fixed Cost and Variable Cost
11. Name five typical factory overhead expenses.
12. Name five typical corporate overhead expenses.
13. Define – Automation
14. Write the basic elements of an automated system.
15. Differentiate open loop and closed loop control system in an automation system.
16. Identify the five levels of automation in a production plant.
17. What is the role of CIM in manufacturing?
18. What are important applications of CIM in manufacturing planning?
19. What is the main objective of CIM?
20. What are the product related activities of a company?

Part – B

1. Explain in detail, the importance of CIM and also write the reasons for implementing CIM.

2. Draw the CIM wheel and explain its different segments in relation to CIM scope.

3. Explain in detail, elements of an automation system.

4. Explain in detail, the levels of an automation system.

5. (i) Explain in detail, lean manufacturing system.   (ii) Explain in detail, Just-in-time production system and write its benefits.

UNIT-II PRODUCTION PLANNING AND CONTROL AND COMPUTERISED PROCESS PLANNING

Part – A

1. Define – Process Planning

2. Define – Route Sheet

3. Define – Concurrent Engineering

4. Write the benefits of CAPP.

5. Write the types of process planning.

6. What is meant by retrieval CAPP systems?

7. What is meant by generative CAPP systems?

8. Define – Production Planning and Control

9. What are the activities within the scope of production planning?

10. What is the difference between the aggregate production planning and master production

schedule?

11. What is meant by MRP?

12. What are the main inputs to the MRP processor?

13. What are the outputs to the MRP system?

14. Write the benefits of MRP system.

15. What is meant by capacity planning? And write the two stages of capacity planning.

16. Define – Shop Floor Control

17. Write the three phases of shop floor control.

18. Define – Shop Packet

19. Define – Factory Data Collection System

20. Define – MRP II

21. Define – ERP

Part – B

1. Explain in detail, various approaches of CAPP and write the benefits of CAPP.

2. Explain in detail, an aggregate production planning

3. What is meant by MRP? Explain the inputs to MRP and various MRP outputs and also list the benefits of

MRP.

4. Explain in detail, the three phases of shop floor control.

5. Explain in detail (a) MRP-II and (b) ERP

6. Explain in detail, factory data collection system.

UNIT-III   CELLULAR MANUFACTURING

Part – A

1. Define – Group Technology

2. List out the stages in Group Technology.

3. Define – Part Family

4. What are the three methods for solving the problem of grouping parts into part families?

5. What is the difference between a hierarchical structure and a chain type structure in a classification and coding scheme?

6. Write the benefits of GT.

7. Define – Production Flow Analysis (PFA)

8. What is the weakness of PFA?

9. Write the steps involved in production flow analysis.

10. Define – Cellular Manufacturing

11. Explain the two categories of attributes of parts.

12. Write the applications of GT.

13. What is meant by composite part concept?

14. Write the types of machine cells and layouts in GT.

15. Write the various types of coding system.

Part – B

1. (a) Explain in detail, parts classification and coding

   (b) Describe the OPITZ coding system

2. Explain in detail, the production flow analysis.

3. Explain in detail, the composite part concept in cellular manufacturing.

4. Apply the rank order clustering technique to the part-machine incidence matrix in the following table to identify logical part families and machine groups. Parts are identified by letters and machines are identified numerically.

Machines	A	B	C	D	E	F	G	H	I
1	1			1				1	
2					1				1
3			1		1				1
4		1				1			
5	1							1	
6			1						1
7		1				1	1		

Parts

5. Develop the form code (first five digits) in the OPITZ system for the part illustrated in figure.
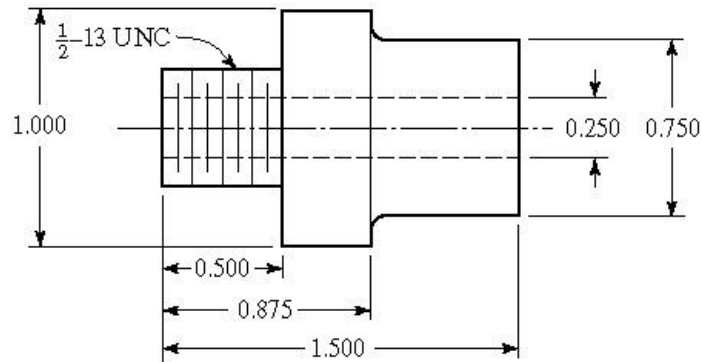
6. Four machines used to produce a family of parts are to be arranged into a GT cell. The From/To data for the parts processed by the machines are shown in the table below. Determine (a) the most logical sequence of machines for this data. (b) construct the network diagram for the data, showing where and how many parts enter and exit the system. (c) compute the percentage of in-sequence moves, bypassing moves and backtracking moves in the solution.

	To			
From	1	2	3	4
1	0	10	0	40
2	0	0	0	0
3	50	0	0	20
4	0	50	0	0

UNIT-IV FLEXIBLE MANUFACTURING SYSTEM (FMS) AND AUTOMATED GUIDED VEHICLE SYSTEM (AGVS)

Part – A

1. Define – FMS

2. What are the components of FMS?

3. What are the objectives of FMS?

4. What are the types of layout configuration in FMS?

5. What is the difference between a dedicated FMS and a random-order FMS?

6. List out any two advantages and disadvantages of FMS implementation.

7. How the FMS is classified based on level of flexibility?

8. How the FMS is classified based on number of machines?

9. What are the types of FMS?

10. What is FMS?

11. Write the FMS benefits.

12. Define – AGVS

13. What are the components of AGVS?

14. Write the types of AGVS.

15. Write the AGVS applications.

16. What is meant by vehicle guidance technology?

17. Name the different AGVS guidance system.

18. What is the purpose of traffic control in AGV system?

19. Write the types of methods of traffic control in AGV system.

Part – B

1. (a) Explain in detail, FMS workstation.

   (b) List the applications of FMS.

2. Explain in detail, the components of FMS and FMS layout configuration.

3. (a) Explain the functions of a FMS computer control system.

   (b) Discuss the application, advantages and disadvantages of a FMS.

4. (a) Explain in detail, the types of AGVS.

   (b) Write the applications of AGVS.

5. (a) Explain in detail, the methods of vehicle guidance technology.

   (b) Explain in detail, the two aspects of vehicle management.

UNIT-V INDUSTRIAL ROBOTICS

Part – A

1. Define – Robot

2. Write the types of joint notations.

3. What are the four basic robot configurations available commercially?

4. What is meant by Work space?

5. Define – Work Volume

6. What is an end effector?

7. Define – Grippers

8. Classify the sensors in robotics

9. Name the various sensors used in industrial robotics

10. Define – Control Resolution, Accuracy and Repeatability of Robot

11. What is meant by pitch, yaw and roll?

12. Write the applications of an industrial robot.

13. Define – Robot Programming

14. Write the types of robot programming methods.

Part – B

1. Explain in detail, the various robot configurations.

2. Explain in detail, the end effectors and sensors in robotics.

3. Explain in detail, the three categories of robot industrial applications.

4. Explain in detail, the various types of robot programming.