KINGS
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Question Bank

Details of the Course

Academic Year	**:2026–2027**
Regulation	**2021**
Name of the Department	**:Mechanical Engineering**
Name of the Course	**:Computer Integrated Manufacturing**
Course Code	**:ME3792**
Semester	**VII**
Common To Programme(s)	**:-**

OUTCOMES: At the end of the course the students would be able to

1. Discuss the basics of computer aided engineering.
2. Choose appropriate automotive tools and material handling systems.
3. Discuss the overview of group technology, FMS and automation identification methods.
4. Design using computer aided process planning for manufacturing of various components
5. Acquire knowledge in computer process control techniques.

Bloom'sLevel:BL1-Remembering,BL2-Understanding,BL3-Applying,BL4-Analyzing,BL5–Evaluating,BL6-Creating.

UNIT-I–INTRODUCTION				
	PART–A(2Marks)	**Bloom'sLevel**	**Course Outcome**	**Marks Allotted**
1.	Define CIM	[BL-1]	[CO1]	[2]
2.	Is CIM a concept or a technology?	[BL-2]	[CO1]	[2]
3.	What are the concepts of CIM?	[BL-1]	[CO1]	[2]
4.	List various components of CIM.	[BL-1]	[CO1]	[2]
5.	Define automation.	[BL-1]	[CO1]	[2]
6.	What is the main objective of CIM?	[BL-1]	[CO1]	[2]
7.	What do you mean by "Islands of Automation"?	[BL-1]	[CO1]	[2]
8.	What is the role of CIM is manufacturing?	[BL-1]	[CO1]	[2]
9.	What do you mean by island of software?	[BL-1]	[CO1]	[2]
10.	What are the important applications of CIM in manufacturing control?	[BL-1]	[CO1]	[2]
11	List the various desirable features of a CAD package	[BL-2]	[CO1]	[2]
12	List out any six drawing features in a CAD package.	[BL-2]	[CO1]	[2]
	Descriptive Questions(13/15Marks)			
1.	Explain the evolution of Computer-Integrated Manufacturing (CIM) and its significance in modern manufacturing. Discuss the key developments that have shaped the growth of CIM over the years	[BL-2]	[CO1]	[13]
2.	Describe the CIM wheel and cycle. Explain how these models illustrate the integration of various elements within a CIM system, and discuss their importance in streamlining manufacturing processes.	[BL-2]	[CO1]	[13]

3.	Discuss the major production concepts used in manufacturing systems. Explain the mathematical models used for production planning and control, providing simple problems and solutions to illustrate their application.	[BL-2]	[CO1]	[13]
4.	Explain the major hardware and software components of a CIM system. Discuss how these components work together to automate and integrate various stages of manufacturing.	[BL-2]	[CO1]	[13]
5.	What are the major elements of a CIM system? Discuss each element in detail, including their roles and how they contribute to the overall efficiency and effectiveness of the manufacturing process.	[BL-2]	[CO1]	[13]
6.	Explain the three-step process for the implementation of a CIM system. Discuss the challenges associated with each step and how they can be effectively addressed to ensure successful integration.	[BL-2]	[CO1]	[13]
7.	Discuss the role of computers in CIM systems. Explain how computer technology is utilized in different stages of the manufacturing process, from design and production to management and control.	[BL-2]	[CO1]	[15]
8.	Describe the role of computer networks in manufacturing systems. Explain how different network architectures and communication protocols support data transfer, machine coordination, and system integration in a CIM environment.	[BL-2]	[CO1]	[15]
	UNIT-II–AUTOMATED MANUFACTURING SYSTEMS			
	PART–A(2Marks)	**Bloom'sLevel**	**Course Outcome**	**Marks Allotted**
1.	What is an automated production line?	[BL-1]	[CO2]	[2]
2.	What are the two main configurations of an automated production line?	[BL-1]	[CO2]	[2]
3.	What are work part transfer mechanisms in automated production lines?	[BL-1]	[CO2]	[2]
4.	What are the fundamental components of an automated assembly system?	[BL-1]	[CO2]	[2]
5.	What is the role of part delivery systems in automated assembly?	[BL-1]	[CO2]	[2]
6.	What is design for automated assembly?	[BL-1]	[CO2]	[2]
7.	What is material handling equipment?	[BL-1]	[CO2]	[2]
8.	What is the importance of material handling system design?	[BL-1]	[CO2]	[2]
9.	What are the 10 principles of material handling?	[BL-1]	[CO2]	[2]
10.	What is a conveyor system and its primary purpose?	[BL-1]	[CO2]	[2]
	Descriptive Questions(13/15Marks)			
1.	Explain the different system configurations used in automated production lines. Discuss the factors influencing the choice of configuration and their impact on production efficiency and flexibility	[BL-2]	[CO2]	[13]
2.	Describe the various work part transfer mechanisms in automated production lines. Analyze their working principles, advantages, limitations, and suitability for different types of manufacturing environments	[BL-2]	[CO2]	[13]
3.	Discuss the fundamentals of automated assembly systems, including system configuration and part delivery mechanisms at workstations. How do these systems improve production efficiency, and what are the challenges in their implementation?	[BL-2]	[CO2]	[13]
4.	Explain the principles of Design for Automated Assembly (DFA). Discuss how DFA techniques influence the product design process and contribute to reducing assembly time, costs, and errors in automated manufacturing. Provide relevant examples	[BL-2]	[CO2]	[13]
5.	Provide a comprehensive overview of material handling equipment used in industrial applications. Discuss the key considerations in designing an effective material handling system and how these considerations impact overall operational efficiency.	[BL-2]	[CO2]	[13]
6.	Describe the 10 principles of material handling. Analyze how these principles guide the design and optimization of material handling systems in	[BL-2]	[CO2]	[13]

	manufacturing and distribution environments, with examples of their practical application			
7.	Examine the different types of conveyor systems used in industrial operations. Discuss their operating principles, features, and the criteria for selecting the appropriate conveyor system based on specific applications and material handling needs	[BL-2]	[CO2]	[15]
8.	Discuss the types and applications of Automated Guided Vehicle (AGV) systems in modern manufacturing and warehousing. Explain the different vehicle guidance technologies and how vehicle management and safety protocols are integrated into AGV operations	[BL-2]	[CO2]	[15]
9.	Evaluate the performance of different storage systems, including conventional methods, Automated Storage/Retrieval Systems (AS/RS), and carousel storage systems. Discuss the role of storage location strategies in optimizing space utilization and retrieval efficiency.	[BL-2]	[CO2]	[15]
10.	What are deadlocks in automated manufacturing systems? Explain how Petrinet models are used to detect and avoid deadlocks in these systems. Discuss their application in smart manufacturing and the role of digital and virtual manufacturing technologies in enhancing system performance.	[BL-2]	[CO2]	[15]
	UNIT-III–PACKAGESAND INTERFACES			
	PART–A(2Marks)	**Bloom'sLevel**	**Course Outcome**	**Marks Allotted**
1.	Define Group Technology (GT).	[BL-1]	[CO3]	[2]
2.	List out the stages in Group Technology	[BL-1]	[CO3]	[2]
3.	Define Part family	[BL-1]	[CO3]	[2]
4.	List the general methods used for grouping parts into families	[BL-1]	[CO3]	[2]
5.	What is PFA?	[BL-1]	[CO3]	[2]
6.	List the steps involved in PFA.	[BL-2]	[CO3]	[2]
7.	What are the 3 basic code structures used in GT applications?	[BL-1]	[CO3]	[2]
8.	What is the main difference between hierarchical code and attribute code structures?	[BL-1]	[CO3]	[2]
9.	List any six coding systems that are widely recognised in industries.	[BL-2]	[CO3]	[2]
10.	What is cellular manufacturing?	[BL-1]	[CO3]	[2]
	Descriptive Questions(13/15Marks)			
1.	Explain the component of FMS and FMS layout configuration.	[BL-2]	[CO3]	[13]
2.	Explain three phases of shop floor control.	[BL-2]	[CO3]	[13]
3.	Write an engineering brief about the various types of automatic identification technologies	[BL-2]	[CO3]	[13]
4.	Write short notes on various materials handling equipment that are commonly Used in a FMS.	[BL-2]	[CO3]	[13]
5.	Discuss the applications, advantages and disadvantages of a FMS	[BL-2]	[CO3]	[13]
6.	Explain about Optiz classification and coding system	[BL-2]	[CO3]	[13]
7.	Explain retrieval and generative CAPP systems	[BL-2]	[CO3]	[15]
8.	Discuss about MICLASS and DCLASS classification and coding system.	[BL-2]	[CO3]	[15]
9.	Briefly discuss the various benefits of implementing a GT in a firm. Also bring Out the advantages and limitations of using GT.	[BL-2]	[CO3]	[15]
10.	(a) Describe the composite part concept in cellular manufacturing. (8) (b) Discuss the importance of process planning in product development.(7)	[BL-2]	[CO3]	[15]
	UNIT-IV–EXCEPTION HANDLING AND MULTI THREADING			

	PART–A(2Marks)	Bloom'sLevel	Course Outcome	Marks Allotted
1.	What is Process planning?	[BL-1]	[CO4]	[2]
2.	List the activities associated with process planning	[BL-1]	[CO4]	[2]
3.	What is meant by CAPP?	[BL-1]	[CO4]	[2]
4.	What are the approaches the CAPP will recognize?	[BL-1]	[CO4]	[2]
5.	Why CAPP systems are called as variant system?	[BL-1]	[CO4]	[2]
6.	Give the main component of generative CAPP systems.	[BL-1]	[CO4]	[2]
7.	What are the results of Process Planning?	[BL-1]	[CO4]	[2]
8.	What are the prerequisites for process planning?	[BL-1]	[CO4]	[2]
9.	What is the weakness of PFA?	[BL-1]	[CO4]	[2]
10.	List some commercial variant and generative CAPP software systems	[BL-1]	[CO4]	[2]
11	What is CMPP?	[BL-1]	[CO4]	[2]
12	What is a data acquisition system?	[BL-1]	[CO4]	[2]
	Descriptive Questions(13/15Marks)			
1.	What are the key activities in process planning and the information required for each? Explain how these activities contribute to effective process planning.	[BL-2]	[CO4]	[13]
2.	How does the transition from design to process planning work? Discuss how process classification affects the selection of primary manufacturing processes.	[BL-2]	[CO4]	[13]
3.	Explain the steps for sequencing operations according to anteriorities. Provide examples and describe how to form and use a Matrix of Anteriorities.	[BL-2]	[CO4]	[13]
4.	What is a typical process sheet in manual process planning? Use a case study to illustrate its role in documenting and communicating process plans	[BL-2]	[CO4]	[13]
5.	Describe Computer-Aided Process Planning (CAPP) and its components, including the process planning module and database. How do they support process planning?	[BL-2]	[CO4]	[13]
6.	Compare Computer-Aided Process Planning (CAPP) with manual process planning. Discuss the advantages and drawbacks of CAPP and provide examples of its benefits.	[BL-2]	[CO4]	[13]
7.	Explain the two basic approaches in computer aided process planning.	[BL-2]	[CO4]	[15]
8.	Explain basic steps or procedures involved in process planning	[BL-2]	[CO4]	[15]
	UNIT-V-PROCESS CONTROL AND DATA ANALYSIS			
	PART–A(2Marks)	Bloom'sLevel	Course Outcome	Marks Allotted
1.	What is an adaptive control?	[BL-1]	[CO5]	[2]
2.	What is a direct digital control (DDC)?	[BL-1]	[CO5]	[2]
3.	What is process model formulation?	[BL-1]	[CO5]	[2]
4.	Why is process model formulation important in control systems?	[BL-1]	[CO5]	[2]
5.	What is a linear feedback control system?	[BL-1]	[CO5]	[2]
6.	What is the role of feedback in a control system?	[BL-1]	[CO5]	[2]
7.	What is optimal control?	[BL-1]	[CO5]	[2]
8.	Give an example of an optimal control problem	[BL-1]	[CO5]	[2]
9.	What is adaptive control?	[BL-1]	[CO5]	[2]
10.	Differentiate between PLC and SCADA.	[BL-1]	[CO5]	[2]

11	What is supervisory computer control?	[BL-1]	[CO5]	[2]
12	What is bar code technology?	[BL-1]	[CO5]	[2]
Descriptive Questions(13/15Marks)				
1.	Discuss the formulation of process models in control systems. What are the key considerations and steps involved in creating an accurate process model?	[BL-2]	[CO5]	[13]
2.	. Explain the principles and applications of linear feedback control systems. How do they work to maintain system stability and performance? Provide examples to illustrate their use.	[BL-2]	[CO5]	[13]
3.	Describe optimal control and its importance in process control systems. How does optimal control differ from traditional control methods, and what are its advantages?	[BL-2]	[CO5]	[13]
4.	What is adaptive control? Discuss its principles, applications, and how it adjusts to changes in system dynamics. Provide examples of scenarios where adaptive control is beneficial.	[BL-2]	[CO5]	[13]
5.	Explain sequence control and the role of PLC (Programmable Logic Controllers) and SCADA (Supervisory Control and Data Acquisition) systems in industrial automation. How do these systems contribute to efficient sequence control?	[BL-2]	[CO5]	[13]
6.	Discuss computer process control and its components, including computer process interface and interface hardware. How do these elements work together to manage and monitor processes?	[BL-2]	[CO5]	[13]
7.	What are the key features of Direct Digital Control (DDC) and Supervisory Computer Control? Compare and contrast these two approaches in terms of functionality and application	[BL-2]	[CO5]	[15]