



**Year/Sem:** III/I

**Course Title:** CAD/CAM

**Course:** ME

**Prerequisites:** To learn the importance and use of computer in design and manufacture

**Course objectives:** To provide an overview of how computers are being used in design, development of manufacturing plans and manufacture. To understand the need for integration of CAD and CAM

**Course Outcomes:**

CO1: Understand geometric transformation techniques in CAD.

CO2: Develop mathematical models to represent curves and surfaces.

CO3: Model engineering components using solid modeling techniques.

CO4: Develop programs for CNC to manufacture industrial components.

CO5: To understand the application of computers in various aspects of Manufacturing and Design

## UNIT WISE QUESTION BANK

### Unit-I

Part–A(Short Answer Questions)					
S No		Question	BT	CO	PO
1		Define CAD and CAM, explaining how they are related within the manufacturing process	L1	CO1	1,3,9
2		What are the key benefits of using CAD/CAM technology in product design and manufacturing?	L1	CO1	1,3,9
3		List three primary types of 3D modeling techniques used in CAD software	L1	CO1	1,3,9
4		Explain the concept of "parametric design" in CAD and its advantages	L1	CO1	1,3,9
5		What is a "wireframe model" and when is it typically used in the design process?	L1	CO1	1,3,9
6		Differentiate between "solid modeling" and "surface modeling" in CAD, providing an example for each?	L2	CO1	1,3,9
7		What is the role of a "toolpath" in CAM software, and how is it generated?	L1	CO1	1,3,9
8		Name three common file formats used for data exchange between CAD and CAM systems .	L1	CO1	1,3,9
9		Briefly explain the concept of "G-code" and its significance in CNC machining .	L2	CO1	1,3,9
10		What are the main considerations when selecting a CAD/CAM software package for a specific manufacturing application?	L2	CO1	1,3,9
Part–B (Long Answer Questions)					
11	a)	Explain the concept of CAD/CAM, defining what "CAD" and "CAM" stand for individually, and how they work together in a product development process.	L2	CO1	1,3,9
	b)	List and explain the key stages involved in a typical CAD/CAM workflow, from initial design concept to final manufactured part	L3	CO1	1,3,9
12		Describe the different types of CAD modeling techniques, including wireframe, surface, and solid modeling, highlighting their advantages and limitations in different design scenarios	L2	CO1	1,3,9
	b)	Discuss the different types of CAM machining processes that can be programmed using CAM software, including milling, turning, drilling, and their applications	L2	CO1	1,3,9
14	a)	What are the key considerations when selecting a CAD/CAM software package for a specific industry or application?	L3	CO1	1,3,9

b)	State the mechanism of material removal, transfer media ,and energy sources used for Un Conventional Machining Process?	L3	CO1	1,3,9
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## Unit-II

( Short Answer) Questions)				
S.No.	Question	BT	CO	PO
1	What is the primary purpose of surface modeling in CAD?	L1	CO2	1,2
2	What are the key elements used to define a surface in surface modeling?	L1	CO2	1,2
3	Name three common surface modeling techniques used in CAD software.	L	CO2	1,2
4	Name three common surface modeling techniques used in CAD software.	L2	CO2	1,2
5	Why is maintaining "tangency" between surfaces important in surface modeling?	L2	CO2	1,2
6	What is a "trim" operation in surface modeling?	L2	CO2	1,2
7	What are "NURBS" and how are they used in surface modeling?	L3	CO2	1,2
8	In what situations would you prefer to use surface modeling over solid modeling?	L1	CO2	1,2
9	Mention two common applications of surface modeling in engineering design.	L1	CO2	1,2
10	What is the primary drawback of using surface modeling compared to solid modeling?	L2	CO2	1,2
part-B (Long Answer Questions)				
11	Explain the concept of surface modeling in computer-aided design (CAD). How does it differ from solid modeling?	L3	CO2	1,2
12	Discuss the different types of surface modeling techniques. Explain each with examples.	L3	CO2	1,2
13	What are the advantages and disadvantages of surface modeling in product design?	L3	CO2	1,2
14	How do NURBS surfaces work in surface modeling? What are their key features?	L3	CO2	1,2
15	What are the challenges faced while working with surface modeling, and how can these challenges be addressed?	L3	CO2	1,2

### Unit-III

<b>Part–A(Short Answer Questions)</b>				
<b>S.No.</b>	<b>Question</b>	<b>BT</b>	<b>CO</b>	<b>PO</b>
1	What does NC stand for in the context of production systems?	L1	CO3	1,9
2	What is the primary function of an NC system in manufacturing?	L1	CO3	1,9
3	What is the difference between NC and CNC (Computer Numerical Control)?	L2	CO3	1,9
4	What kind of code is typically used in NC programming?	L2	CO3	1,9
5	What are the key components of an NC system?	L2	CO3	1,9
6	What is the significance of "interpolation" in NC systems?	L2	CO3	1,9
7	How does NC improve manufacturing efficiency?	L3	CO3	1,9
8	What is meant by "point-to-point" control in NC?	L1	CO3	1,9
9	What does a "tool path" refer to in an NC system?	L1	CO3	1,9
10	What is the role of a feedback system in an NC system?	L2	CO3	1,9

Part–B (Long Answer Questions)					
11		Explain the concept of Numerical Control (NC) in manufacturing. How does it enhance precision and productivity in the production process?	L3	CO3	1,9
12	a)	Describe the differences between Manual, CNC, and DNC systems in manufacturing. What are the advantages of CNC over traditional NC?	L3	CO3	1,9
	b)	What are the main types of NC machine tools? Explain each with examples of their applications in industry.	L3	CO3	1,9
13	a)	What are the major components of an NC system? Explain the role of each component in the overall functioning of the system.	L3	CO3	1,9
14	a)	Explain the concept of Direct Numerical Control (DNC). How does DNC improve production management, and what are the challenges associated with its implementation?	L2	CO3	1,9
	b)	What is Computer Numerical Control (CNC)? How does it differ from traditional NC and what are its key benefits in modern manufacturing industries?	L3	CO3	1,9
15		Discuss the advantages and limitations of NC systems in production environments. How does NC contribute to the flexibility and automation of manufacturing processes?	L3	CO3	1,9

#### IV

<b>Part–A(Short Answer Questions)</b>				
<b>S.No.</b>	<b>Question</b>	<b>BT</b>	<b>CO</b>	<b>PO</b>
1	What is Group Technology (GT)?	L4	CO4	1,9
2	Define part family.	L4	CO4	1,9
3	What is the significance of Group Technology in manufacturing?	L4	CO4	1,9
4	List any two benefits of using Group Technology.	L4	CO4	1,9
5	What is cellular manufacturing?	L4	CO4	1,9
6	Define production flow analysis (PFA).	L4	CO4	1,9

<b>Part–B(longAnswer Questions)</b>				
<b>S.No.</b>	<b>Question</b>	<b>BT</b>	<b>CO</b>	<b>PO</b>
7	Explain in detail the steps involved in implementing Group Technology in an organization.	L1	CO4	1,9
8	Discuss the role of classification and coding systems in Group Technology.	L1	CO4	1,9
9	Explain how cellular manufacturing improves productivity. Illustrate with a layout diagram.	L2	CO4	1,9
10	What are the types of classification and coding systems in GT? Describe any one in detail.	L2	CO4	1,9
11	Discuss how Group Technology helps in reducing throughput time and improving quality.	L2	CO4	1,9
12	Explain the methodology of Production Flow Analysis with an example matrix.	L2	CO4	1,9

**Part–A(Short Answer Questions)**

<b>S.No.</b>	<b>Question</b>	<b>BT</b>	<b>CO</b>	<b>PO</b>
1	What is a Flexible Manufacturing System (FMS)? Explain its components.	L4	CO5	1,9
2	Differentiate between FMS and traditional manufacturing systems.	L4	CO5	1,9
3	What are the types of FMS? Explain with examples.	L4	CO5	1,9
4	What are the objectives and advantages of FMS?	L4	CO5	1,9
5	Discuss the limitations of FMS in modern industries.	L4	CO5	1,9
6	What is the function of a central control computer in FMS?	L4	CO5	1,9

**Part–B(longAnswer Questions)**

<b>S.No.</b>	<b>Question</b>	<b>BT</b>	<b>CO</b>	<b>PO</b>
7	Discuss the types of flexibility in manufacturing systems.	L1	CO5	1,9
8	What are the advantages and limitations of FMS?	L1	CO5	1,9
9	Explain the integration of CAD, CAM, and FMS.	L2	CO5	1,9
10	Describe the layout configurations used in FMS.	L2	CO5	1,9
11	How does FMS support Just-In-Time (JIT) manufacturing?	L2	CO5	1,9
12	Explain how a CNC machine is used within an FMS.	L3	CO5	1,9