

Hall Ticket No

Question Paper Code: AAE521



**INSTITUTE OF AERONAUTICAL ENGINEERING**  
**(Autonomous)**  
Dundigal, Hyderabad - 500 043

**MODEL QUESTION PAPER - I**

B. Tech VI Semester End Examinations, April/May – 2020

**Regulations: IARE - R16**

**CAD/CIM**

(AERONAUTICAL ENGINEERING)

**Time: 3 hours**

**Max. Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

**UNIT – I**

1. a) Briefly Explain the conventional process of the product cycle in the conventional manufacturing environment. [7M]
- b) Explain the concept of obtaining reflection about an arbitrary line starting from plane reflection about an axis. How do you obtain the orthographic projection of geometric database. [7M]
2. a) Write briefly about the secondary storage devices used in CAD System. Describe the basic requirements that CAD software has to satisfy. [7M]
- b) Draw and explain the block diagram of product cycles in a computerized manufacture environment. [7M]

**UNIT – II**

3. a) Explain the types of surfaces that CAD/CIM systems use. Distinguish between analytical and synthetic surface. [7M]
- b) Explain the procedure to ensure convex hull property in Bezier surface. Describe the effect of characteristic polyhedron over the resulting Bezier surface. [7M]
4. a) Differentiate between Bezier and B- spline surface with reference to number of Control points, order of continuity and surface normal. [7M]
- b) Deduce the condition for C0 and C1 continuity in a cubic Bezier composite surface of two patches. [7M]

**UNIT – III**

5. a) Explain MICLASS coding system in GT. [7M]
- b) What are part families in group technology? Discuss machine cell design in GT. [7M]
6. a) Write briefly on contact inspection methods? Explain the need for automated inspection strategies in manufacturing plant. [7M]
- b) Explain the steps involved in Production flow analysis. Explain the reason to carry out [7M]

such analysis.

#### **UNIT – IV**

7. a) What are the various innovations introduced in tooling for flexible manufacturing systems? [7M]  
b) How does a turning centre differ from an FMC? Describe the essential elements of a flexible turning cell. [7M]
8. a) Write briefly on contact inspection methods? Explain the need for automated inspection strategies in manufacturing plant. [7M]  
b) What is computer aided process planning (CAPP)? Explain retrieval and generative type in computer aided process planning. [7M]

#### **UNIT – V**

9. a) Explain the different types of computer control systems used in CIM. [7M]  
b) Explain in the details the different data files in CIM and the system reports generated by CIM. [7M]
- 10 a) What is a CIM wheel? Discuss its strength and weakness as an elucidator of CIM's scope. [7M]  
b) Discuss the possible computer applications in Manufacturing Planning activities [7M]



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CAD/CIM

## COURSE OBJECTIVES

The course should enable the students to:

S. No	Description
I	Understand the basics of computer aided designing, computer aided manufacturing and computer integrated manufacturing.
II	To study about group technology, computer aided process planning, material requirement planning (MRP) Enterprise resource planning (ERP).
III	Gain knowledge about shop floor control and Flexible manufacturing systems (F.M.S).
IV	Emphasizes the integration of manufacturing enterprise using computer integrated manufacturing (CIM) technologies.

## COURSE OUTCOMES (COs):

CO 1:	Understand the basic foundation in computer aided design / manufacturing
CO 2:	Understand the fundamentals used to create and manipulate geometric models
CO 3:	Learn the working principles of machines, coding system and part programming
CO 4:	Understand concept of FMS and CAPP.
CO 5:	Understand the concept of Computer integrated manufacturing.

## COURSE LEARNING OUTCOMES

Students, who complete the course, will be able to demonstrate the ability to do the following

AAE521.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.
AAE521.02	Demonstrate the ability to create concepts design solutions through CAD tools that can be manufactured using CNC machinery.
AAE521.03	Understand the Computers in industrial manufacturing, product cycle, CAD / CAM Hardware.
AAE521.04	Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.
AAE521.05	Understand of the principles of CAD/CAM, including engineering drawing, geometric and surface modeling, and feature-based design.
AAE521.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.
AAE521.07	Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CAM-based product development.
AAE521.08	Explain the basic concepts of G. T in CAD/CAM integration.
AAE521.09	Explain the basic concepts of CNC programming and machining.
AAE521.10	Classify the DCLASS and MCLASS and OPTIZ coding systems.
AAE521.11	Explain the approaches to computer aided process planning.
AAE521.12	Compare and contrast CAPP and CMPP systems.
AAE521.13	Understand grouping of similar parts through group technology and developing automated process plans through computer aided process planning.
AAE521.14	Illustrate group technology, computer aided quality control.
AAE521.15	Understand different elements of robotic systems. Also understand the different components and design of FMS.

AAE521.16	Apply the contact and non-contact types inspection with computer aided testing with integration of computer aided quality with CAD/CAM
AAE521.17	Apply the concepts/components of computer integrated manufacturing and integrate them.
AAE521.18	Understand the production planning and control, cost planning and control, inventory management.
AAE521.19	Design automated material handling and storage systems for a typical production system
AAE521.20	Apply the concepts/components of computer integrated manufacturing and integrate them.
AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.

### MAPPING OF SEE – COURSE OUTCOMES

SEE		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
Question No					
1	a	AAE521.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.	CO 1	Understand
	b	AAE521.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.	CO 1	Understand
2	a	AAE521.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.	CO 1	Remember
	b	AAE521.02	Demonstrate the ability to create concepts design solutions through CAD tools that can be manufactured using CNC machinery.	CO 1	Remember
3	a	AAE521.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.	CO 2	Remember
	b	AAE521.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.	CO 2	Understand
4	a	AAE521.07	Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CIM-based product development.	CO 2	Remember
	b	AAE521.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.	CO 2	Understand
5	a	AAE521.10	Classify the DCLASS and MCLASS and OPTIZ coding systems.	CO 3	Remember
	b	AAE521.11	Explain the approaches to computer aided process planning.	CO 3	Understand
6	a	AAE521.09	Explain the basic concepts of G. T in CAD/CAM integration.	CO 3	Understand
	b	AAE521.10	Classify the DCLASS and MCLASS and OPTIZ coding systems.	CO 3	Remember
7	a	AAE521.14	Illustrate group technology, computer aided quality control.	CO 4	Remember
	b	AAE521.14	Illustrate group technology, computer aided quality control.	CO 4	Understand
8	a	AAE521.16	Apply the contact and non-contact types inspection with computer aided testing with integration of computer aided quality with CAD/CIM.	CO 4	Remember
	b	AAE521.16	Apply the contact and non-contact types inspection with computer aided testing with integration of computer	CO 4	Remember

			aided quality with CAD/CIM.		
9	a	AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.	CO 5	Remember
	b	AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.	CO 5	Remember
10	a	AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.	CO 5	Understand
	b	AAE521.20	Apply the concepts/components of computer integrated manufacturing and integrate them.	CO 5	Remember

**Signature of Course Coordinator**

**HOD, AE**