

Hall Ticket No

Question Paper Code: AAE521



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## MODEL QUESTION PAPER - II

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) What are the design related tasks performed by modern computer? Explain with block diagram. [7M]
2. a) Draw and explain the block diagram of product cycles in a computerized manufacture environment. [7M]
- b) Summarize your understanding of synthesis and engineering analysis in the field of design. Explain how CAD helps to synthesize a product design and do engineering analysis for getting optimal design. [7M]

### UNIT – II

3. a) Explain 3-D scaling, rotation, reflection and translation with suitable example? [7M]
- b) What is the need for concatenation of transformations? Explain what care should be taken in such cases. [7M]
4. a) A scaling factor of 2 is applied in the Y direction while no scaling is applied in the X direction to the line whose two endpoints are at coordinates (1, 3) and (3, 6). The line is to be rotated subsequently through 300, in the counter clockwise direction. Determine the necessary transformation matrix for the operation and the new coordinates of the end points. [7M]
- b) Find the transformed coordinates when a square [(1, 1), (2, 1), (1, 2) and (2, 2)] is rotated by 90° anticlockwise about a line passing through one of its vertex (1, 1) and parallel to x-axis? [7M]

### UNIT – III

5. a) Compare a process type layout and group technology layout for batch production of a simple component. [7M]
- b) How do you overcome the difficulties in traditional process planning by adopting CAPP [7M]

- method?
6. a) Discuss the different stages of a group technology plan. Discuss the types of work that are to be conducted at each stage of the plan. [7M]
- b) Discuss the importance of process planning in product development. What are the advantages? [7M]

#### UNIT – IV

7. a) How do you overcome the difficulties in traditional process planning by adopting CAPP method? [7M]
- b) What is computer aided process planning? Discuss variant process planning in detail with an example? [7M]
8. a) Write briefly on contact inspection methods? Explain the need for automated inspection strategies in manufacturing plant. [7M]
- b) Discuss the different types of CAPP systems available in the market based on retrieval and generative types CAPP. [7M]

#### UNIT – V

9. a) Why is enterprise resource planning a holistic approach to manufacturing planning? [7M]
- b) Explain in detail the different types of database requirements in CIM. Discuss the integration of CAD database and CMM operation. [7M]
10. a) Why are the unskilled labours replaced with skilled labours in computer integrated manufacturing systems? [7M]
- b) Explain in the details the different data files in CIM and the system reports generated by CIM. [7M]



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## 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	AAE521.02	Demonstrate the ability to create concepts design solutions through CAD tools that can be manufactured using CNC machinery.	CO 1	Remember
	b	AAE521.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.	CO 1	Remember
3	a	AAE521.05	Understand of the principles of CAD/CIM, including engineering drawing, geometric and surface modeling, and feature	CO 2	Remember
	b	AAE521.05	Understand of the principles of CAD/CIM, including engineering drawing, geometric and surface modeling, and feature	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	AAE521.07	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	Understand
5	a	AAE521.09	Explain the basic concepts of G. T in CAD/CAM integration.	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	AAE521.09	Explain the basic concepts of G. T in CAD/CAM integration.	CO 3	Remember
7	a	AAE521.14	Illustrate group technology, computer aided quality control.	CO 4	Remember
	b	AAE521.15	Understand different elements of robotic systems. Also understand the different components and design of FMS.	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 aided quality with CAD/CIM.	CO 4	Remember
9	a	AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.	CO 5	Remember
	b	AAE521.20	Apply the concepts/components of computer integrated manufacturing and integrate them.	CO 5	Remember
10	a	AAE521.20	Apply the concepts/components of computer integrated manufacturing and integrate them.	CO 5	Understand
	b	AAE521.21	Understand data management and its important for decision making in computer integrated manufacturing system.	CO 5	Remember

**Signature of Course Coordinator**

**HOD, AE**