Hall Ticket No | | | | | | | | | | | Question Paper Code: AME018

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-II

B.Tech VII Semester End Examinations, November-2019

Regulations: IARE-R16

Computer Aided Design/ Computer Aided Manufacturing

(ME)

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)	Write briefly about the secondary storage devices used in CAD System. Describe the basic requirements that CAD software has to satisfy.	**[7M]**
	b)	Describe the product cycle followed in a CAD/CAM system.Elaborate on the basic requirements that CAD software has to satisfy.	**[7M]**
2.	a)	Draw and explain the block diagram of product cycles in a computerised manufacture environment.	**[7M]**
	b)	List the advantages of computer aided design. State clearly the difficulties a design engineer has to face at each of the design stages if they are carried out manually.	**[7M]**

UNIT – II

3.	a)	Define the cubic spline and Bezier curves. Which of them is more popular in CAD and why?	**[7M]**
	b)	A scaling factor of 3 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, 4) and (2, 6). The line is to be rotated subsequently through 200, in the counter clockwise direction. Determine the necessary transformation matrix for the operation and the new coordinates of the end points	**[7M]**
4.	a)	Explain 3-D scaling, rotation, reflection and translation with suitable example?	**[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)	Design the Manual Part Programming manuscript sheet and explain how the entries are made in the sheet with the help of an example.	**[7M]**
	b)	Distinguish between point-to-point control and continuous path control in NC system.	**[7M]**
6.	a)	Describe the axis representation system used for CNC Milling machines. Discuss the various interpolation methods used in NC machines.	**[7M]**

	b)	Discuss the concept of adaptive control and also explain its types. Differentiate CNC and DNC control systems.	**[7M]**

UNIT – IV

7.	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? Discuss variant process planning in detail with an example?	**[7M]**
8.	a)	Explain the need for automated inspection strategies in a manufacturing plant.Compare and contrast, contact and non-contact inspection techniques	**[7M]**
	b)	Explain the application and advantages of integration of CAQC with CAD/CAM systems, discuss the objectives of CAQC. Explain the different computer aided inspection methods.	**[7M]**

UNIT– V

9.	a)	What is a CIM wheel? Discuss its strength and weakness as an elucidator of CIM's scope.	**[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)	Discuss the possible computer applications in Manufacturing Planning activities.	**[7M]**
	b)	Explain the Applying and advantages of integration of CIM with CAD/CAM systems.	**[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

I	Understand the concepts of implementation of automation and PLMS in industries practicing CIM.
II	Recognize the need of computer graphics in seamless manufacturing environment.
III	Summarize the historical development of CAD/CAM software and CNC Technology.
IV	Categorize the creation of group technology of part families and end-end utility.

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 working principles of NC machines CNC control and part programming.
CO 4	Understand concept of Group Technology, FMS, CAPP.
CO 5	Understand the concept of Computer integrated manufacturing.

COURSE LEARNING OUTCOMES (CLOs):

AME018.01	Describe basic structure of CAD workstation, Memory types, input/output devices and display devices and computer graphics.
AME018.02	Demonstrate the ability to create concepts design solutions through CAD tools that can be manufactured using CNC machinery.
AME018.03	Understand the Computers in industrial manufacturing, product cycle, CAD / CAM Hardware.
AME018.04	Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.
AME018.05	Understand of the principles of CAD/CAM, including engineering drawing, geometric and surface modeling, and feature-based design.
AME018.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.
AME018.07	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.
AME018.08	Explain Synthetic curves andthe concept of NURBS
AME018.09	Explain the basic concepts of CNC programming and machining
AME018.10	Develop CNC programs to manufacture industrial components.
AME018.11	Generate tool path for part and to create CNC manual part program and APT part program
AME018.12	Apply the concepts of machining for the purpose of selection of appropriate machining centers, machining parameters, select appropriate cutting tools for CNC milling and turning.
AME018.13	Understand grouping of similar parts through group technology and developing automated process plans through computer aided process planning.

AME018.14	Illustrate group technology, computer aided quality control.
AME018.15	Understand different elements of robotic systems. Also understand the different components and design of FMS.
AME018.16	Apply the contact and non-contact types inspection with computer aided testing with integration of computer aided quality with CAD/CAM
AME018.17	Understand automated material handling systems and integration of material handling and storage
AME018.18	Analyze various automated flow lines and line balancing problem.
AME018.19	Design automated material handling and storage systems for a typical production system
AME018.20	Apply the concepts/components of computer integrated manufacturing and integrate them.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	AME12.02	Demonstrate the ability to create concepts design solutions through CAD tools that can be manufactured using CNC machinery.	CO 1	Understand
	b	AME12.03	Understand the Computers in industrial manufacturing, product cycle, CAD / CAM Hardware.	CO 1	Understand
2	a	AME12.04	Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.	CO 1	Understand
	b	AME12.04	Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.	CO 1	Understand
3	a	AME12.06	Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications.	CO 2	Understand
	b	AME12.07	Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CAM	CO 2	Remember
4	a	AME12.07	Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CAM	CO 2	Understand
	b	AME12.07	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	CO 2	Understand
5	a	AME12.09	Explain the basic concepts of CNC programming and machining.	CO 3	Understand
	b	AME12.10	Develop CNC programs to manufacture industrial components.	CO 3	Understand
6	a	AME12.09	Explain the basic concepts of CNC programming and machining	CO 3	Understand
	b	AME12.10	Develop CNC programs to manufacture industrial components.	CO 3	Understand
7	a	AME12.13	Understand grouping of similar parts through group technology and developing automated process plans through computer aided process planning.	CO 4	Understand
	b	AME12.13	Understand grouping of similar parts through group technology and developing automated process plans through computer aided process planning.	CO 4	Understand

8	a	AME12.16	Apply the contact and non-contact types inspection with computer aided testing with integration of computer aided quality with CAD/CAM	CO 4	Understand
	b	AME12.19	Apply the contact and non-contact types inspection with computer aided testing with integration of computer aided quality with CAD/CAM	CO 4	Understand
9	a	AME12.20	Apply the concepts/components of computer integrated manufacturing and integrate them	CO 5	Understand
	b	AME12.20	Apply the concepts/components of computer integrated manufacturing and integrate them	CO 5	Understand
10	a	AME12.20	Apply the concepts/components of computer integrated manufacturing and integrate them	CO 5	Understand
	b	AME12.20	Apply the concepts/components of computer integrated manufacturing and integrate them	CO 5	Understand

Signature of Course Coordinator **HOD, ME**