



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad-500043

AERONAUTICAL ENGINEERING

TUTORIAL QUESTION BANK

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|-------------------|----------------------------|-----------|---------|------------|---------|
| Course Title | CAD/CIM | | | | |
| Course Code | AAE521 | | | | |
| Programme | B.Tech | | | | |
| Semester | VI | AE | | | |
| Course Type | ELECTIVE | | | | |
| Regulation | IARE - R16 | | | | |
| Course Structure | Theory | | | Practical | |
| | Lectures | Tutorials | Credits | Laboratory | Credits |
| | 3 | - | 3 | 3 | 2 |
| Chief Coordinator | Dr. D Govardhan, Professor | | | | |
| Course Faculty | Dr. D Govardhan, Professor | | | | |

COURSE OBJECTIVES:

The course should enable the students to:

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| 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):

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| 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 (CLO'S):**Students, who complete the course, will have demonstrated the ability to do the following:**

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| 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/CIM, 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/CIM-based product development. |
| AAE521.08 | Explain Synthetic curves and the concept of NURBS |
| AAE521.09 | Explain the basic concepts of G. T in CAD/CAM integration. |
| 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/CIM |
| AAE521.17 | Understand automated material handling systems and integration of material handling and storage |
| AAE521.18 | Analyze various automated flow lines and line balancing problem. |
| 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. |

UNIT – I**INTRODUCTION****PART – A (SHORT ANSWER QUESTIONS)**

| S No | QUESTION | Blooms Taxonomy Level | Course Outcome | Course Learning Outcomes |
|-------------|--|------------------------------|-----------------------|---------------------------------|
| 1 | Explain about the memory devices used in NC, CNC and DNC machines. | Understand | CO 1 | AAE521.01 |
| 2 | What is raster scan graphics system. | Remember | CO 1 | AAE521.01 |
| 3 | What is the software configuration of a graphics system. | Remember | CO 1 | AAE521.01 |
| 4 | How does a CRT work. | Understand | CO 1 | AAE521.01 |
| 5 | List the applications of computer graphics. | Understand | CO 1 | AAE521.01 |
| 6 | Give a brief note on storage devices. | Understand | CO 1 | AAE521.05 |
| 7 | List the different types of industrial manufacturing. | Understand | CO 1 | AAE521.02 |
| 8 | Briefly describe the types of storage devices used in computers. | Understand | CO 1 | AAE521.01 |
| 9 | What do you understand by the CPU? | Remember | CO 1 | AAE521.02 |
| 10 | What is the software configuration of a graphics system | Remember | CO 1 | AAE521.03 |
| 11 | List the advantages of computer aided design and Manufacturing | Understand | CO 1 | AAE521.01 |
| 12 | Define the terms CAD and CIM. | Understand | CO 1 | AAE521.01 |
| 13 | What are the benefits of computer aided design over conventional design process. | Understand | CO 1 | AAE521.03 |
| 14 | List out the various applications in CAD/CIM. | Understand | CO 1 | AAE521.01 |
| 15 | Identify the types of printers that would be useful for printing graphic information. | Remember | CO 1 | AAE521.01 |
| 16 | Describe the various types input devices used in CAD Work station. | Remember | CO 1 | AAE521.01 |
| 17 | Briefly Explain the conventional process of the product cycle in the conventional manufacturing environment. | Understand | CO 1 | AAE521.01 |
| 18 | Explain the computer aided design process with the help of block diagram. | Understand | CO 1 | AAE521.01 |
| 19 | List out the various types of Graphical Terminals in CAD systems and explain any one. | Understand | CO 1 | AAE521.05 |
| 20 | What is clipping. Explain with a diagram. | Understand | CO 1 | AAE521.02 |
| 21 | Discuss the concept of hidden line removal method and shading. | Remember | CO 1 | AAE521.01 |

PART – B (LONG ANSWER QUESTIONS)

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|---|--|------------|------|-----------|
| 1 | Briefly explain the conventional process of the product cycle in the conventional manufacturing environment. | Understand | CO 1 | AAE521.01 |
| 2 | What are the designs related tasks performed by modern computer? Explain with block diagram. | Remember | CO 1 | AAE521.01 |

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|--|---|------------|------|-----------|
| 3 | Discuss various CAD input devices with suitable diagrams. | Remember | CO 1 | AAE521.02 |
| 4 | Describe the various types input devices used in CAD Work station. | Understand | CO 1 | AAE521.01 |
| 5 | Describe the product cycle followed in a CAD/CIM system. | Understand | CO 1 | AAE521.03 |
| 6 | Elaborate on the basic requirements that CAD software has to satisfy. | Understand | CO 1 | AAE521.03 |
| 7 | What are the functions of an interactive graphic design workstation? | Understand | CO 1 | AAE521.01 |
| 8 | How the product cycle is revised with introduction of CAD/CIM. | Remember | CO 1 | AAE521.01 |
| 9 | What are the various memories used in a computer? | Remember | CO 1 | AAE521.02 |
| 10 | Discuss various CAD input devices with suitable diagrams. | Understand | CO 1 | AAE521.03 |
| 11 | Write briefly about the secondary storage devices used in CAD System. | Understand | CO 1 | AAE521.01 |
| 12 | Describe the basic requirements that CAD software has to satisfy. | Remember | CO 1 | AAE521.01 |
| 13 | Draw and explain the block diagram of product cycles in a computerized manufacture environment. | Remember | CO 1 | AAE521.02 |
| 14 | 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. | Understand | CO 1 | AAE521.01 |
| 15 | Briefly Explain the conventional process of the product cycle in the conventional manufacturing environment. | Understand | CO 1 | AAE521.03 |
| 16 | Explain the computer aided design process with the help of block diagram. | Understand | CO 1 | AAE521.03 |
| 17 | List out the various types of Graphical Terminals in CAD systems and explain any one. | Understand | CO 1 | AAE521.01 |
| 18 | What are the different graphic display devices. Explain at least two display devices in detail. | Understand | CO 1 | AAE521.01 |
| 19 | What is transformation. How many types of transformation are there to change geometry. | Remember | CO 1 | AAE521.01 |
| 20 | 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. | Understand | CO 1 | AAE521.01 |
| 21 | Explain the concept of concatenation of transformation of matrices using suitable 2D example. | Remember | CO 1 | AAE521.01 |
| PART – C (ANALYTICAL QUESTIONS) | | | | |
| 1 | Represent a circle with center (0,0) and radius of 50mm through the implicit form as well as the parametric form. | Understand | CO 1 | AAE521.02 |
| 2 | Describe the various types input devices used in CAD Work station. | Remember | CO 1 | AAE521.02 |
| 3 | 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. | Remember | CO 1 | AAE521.02 |
| 4 | Define Bezier curve and Discuss the important characteristics of a Bezier curve. | Understand | CO 1 | AAE521.03 |

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|----|---|------------|------|-----------|
| 5 | Explain with suitable flow diagram the various steps involved in Design process. | Understand | CO 1 | AAE521.02 |
| 6 | 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. | Understand | CO 1 | AAE521.02 |
| 7 | Discuss the different types of curvature continuity with suitable sketches. | Understand | CO 1 | AAE521.02 |
| 8 | Write briefly about the secondary storage devices used in CAD System. Describe the basic requirements that CAD software has to satisfy. | Remember | CO 1 | AAE521.02 |
| 9 | Discuss the various types of curve fitting techniques in detail. | Remember | CO 1 | AAE521.01 |
| 10 | Draw and explain the block diagram of product cycles in a computerized manufacture environment. | Understand | CO 1 | AAE521.02 |

UNIT – II

GEOMETRICAL MODELLING

PART – A (SHORT ANSWER QUESTIONS)

| | | | | |
|----|---|------------|------|-----------|
| 1 | Explain the characteristics of Bezier curve? | Understand | CO 2 | AAE521.05 |
| 2 | Write a brief note on solid 5 modeling. | Remember | CO 2 | AAE521.05 |
| 3 | Explain the characteristics of Bezier curve? | Remember | CO 2 | AAE521.06 |
| 4 | Explain the details of polygon clipping. | Understand | CO 2 | AAE521.07 |
| 5 | Explain Boundary representation modeling. | Understand | CO 2 | AAE521.05 |
| 6 | Write a note on: i. NURBS ii. B-splines. | Understand | CO 2 | AAE521.08 |
| 7 | Explain re-parameterization of a surface | Remember | CO 2 | AAE521.06 |
| 8 | Explain the concept of parametric surface and Discuss the various boundary conditions of parametric surface | Understand | CO 2 | AAE521.06 |
| 9 | Distinguish between Synthetic and analytical surfaces | Remember | CO 2 | AAE521.05 |
| 10 | List out the three modeling schemes. | Remember | CO 2 | AAE521.05 |
| 11 | Give difference between synthetic and analytical curve. | Remember | CO 2 | AAE521.05 |
| 12 | Write parametric equation of Hermite Cubic curve. | Remember | CO 2 | AAE521.06 |
| 13 | Explain re-parameterization of a surface | Understand | CO 2 | AAE521.07 |
| 14 | Differentiate between weighing function and blending function | Understand | CO 2 | AAE521.05 |
| 15 | Describe the mathematical representation and application of ruled surface. | Understand | CO 2 | AAE521.08 |
| 16 | Distinguish between Boundary representation and CSG in solid modeling | Remember | CO 2 | AAE521.06 |
| 17 | Discuss blending function. Explain re parameterization of a surface. | Understand | CO 2 | AAE521.06 |
| 18 | Distinguish between Geometry and Topology | Remember | CO 2 | AAE521.05 |
| 19 | Name different types of Analytical surfaces and synthetic surfaces. | Remember | CO 2 | AAE521.05 |
| 20 | Distinguish between geometric form and algebraic form of surface Representation | Remember | CO 2 | AAE521.05 |

PART - B (LONG ANSWER QUESTIONS)

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|----|---|------------|------|-----------|
| 1 | Give the details of Z-buffer method for hidden surface removal | Understand | CO 2 | AAE521.05 |
| 2 | Define the cubic spline and Bezier curves. Which of them is more popular in CAD and why? | Remember | CO 2 | AAE521.05 |
| 3 | Give details of a few editing commands used in a drafting system. | Remember | CO 2 | AAE521.06 |
| 4 | Explain 3-D scaling, rotation, reflection and translation with suitable example? | Understand | CO 2 | AAE521.05 |
| 5 | What is the need for concatenation of transformations? Explain what care should be taken in such cases. | Understand | CO 2 | AAE521.05 |
| 6 | Explain the details of polygon clipping. Give its advantages compared to the line clipping | Understand | CO 2 | AAE521.07 |
| 7 | Explain constructive solid geometry modeling techniques in detail with example? | Understand | CO 2 | AAE521.07 |
| 8 | What is the need for concatenation of transformations? Explain what care should be taken in such cases. | Remember | CO 2 | AAE521.06 |
| 9 | What are the functions of an interactive graphic design workstation? | Remember | CO 2 | AAE521.06 |
| 10 | What is meant by a Geometric Entity? Explain the common entities used in Geometric Modeling. | Understand | CO 2 | AAE521.06 |
| 11 | Explain the procedure of parametric representation of B-spline curves. | Understand | CO 2 | AAE521.05 |
| 12 | Write the brief note on the parametric representation of a Bezier curve. | Understand | CO 2 | AAE521.07 |
| 13 | Write the mathematical representation of a cylindrical surface and its applications. | Understand | CO 2 | AAE521.07 |
| 14 | Explain the types of surfaces that CAD/CIM systems use. Distinguish between analytical and synthetic surface | Remember | CO 2 | AAE521.06 |
| 15 | Explain the procedure to ensure convex hull property in Bezier surface. Describe the effect of characteristic polyhedron over the resulting Bezier surface. | Remember | CO 2 | AAE521.06 |
| 16 | Explain the blending functions required in practical solid modeling applications. | Understand | CO 2 | AAE521.06 |
| 17 | Deduce the condition for C0 and C1 continuity in a cubic Bezier composite surface of two patches. | Understand | CO 2 | AAE521.05 |
| 18 | Explain different methods of solid modeling using sweeping. | Understand | CO 2 | AAE521.07 |
| 19 | Differentiate between Bezier and B- spline surface with reference to number of Control points, order of continuity and surface normal. | Understand | CO 2 | AAE521.07 |
| 20 | Deduce the condition for C0 and C1 continuity in a cubic Bezier composite surface of two patches. | Remember | CO 2 | AAE521.06 |

Part - C (ANALYTICAL QUESTIONS)

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| 1 | 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 | Understand | CO 2 | AAE521.07 |
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| | direction. Determine the necessary transformation matrix for the operation and the new coordinates of the end points | | | |
| 2 | 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? | Remember | CO 2 | AAE521.07 |
| 3 | Find the transformed coordinates when a line [(3, 4), (4, 2),] is rotated about a z axis by an angle of 45° in anticlockwise direction? | Remember | CO 2 | AAE521.06 |
| 4 | Find the degree of Bezier curve controlled by three points (4, 2), (0, 0) and (2, 8). Also find the equation of the Bezier curve in parametric format with parameter “μ”? | Understand | CO 2 | AAE521.05 |
| 5 | What do you understand by Geometric transformation? Explain any three common transformations used in computer graphics. | Remember | CO 2 | AAE521.06 |
| 6 | Differentiate between Bezier and B-spline surface with reference to number of control points, order of continuity and surface normal. | Remember | CO 2 | AAE521.06 |
| 7 | Discuss blending function. Explain re parameterization of a surface | Understand | CO 2 | AAE521.05 |
| 8 | Deduce the condition for C0 and C1 continuity in a cubic Bezier composite surface of two patches | Understand | CO 2 | AAE521.06 |
| 9 | Explain the concept of parametric surface and Discuss the various boundary conditions of parametric surface | Understand | CO 2 | AAE521.07 |
| 10 | Explain the procedure to ensure convex hull property in Bezier surface Describe the effect of characteristic polyhedron over the resulting Bezier surface. | Remember | CO 2 | AAE521.08 |

UNIT-III

GROUP TECHNOLOGY COMPUTER AIDED PROCESS PLANNING

PART – A (SHORT ANSWER QUESTIONS)

| | | | | |
|----|--|------------|------|-----------|
| 1 | Enumerate the advantages of group technology. | Remember | CO 3 | AAE521.09 |
| 2 | What is a part family? | Understand | CO 3 | AAE521.09 |
| 3 | Explain various methods of part formation. | Understand | CO 3 | AAE521.10 |
| 4 | What is the need for CAD based process plans? | Remember | CO 3 | AAE521.10 |
| 5 | What are the advantages of Process planning in manufacturing industries? | Remember | CO 3 | AAE521.09 |
| 6 | What are various languages used in GT? | Remember | CO 3 | AAE521.10 |
| 7 | List the types of attributes in part similarities | Remember | CO 3 | AAE521.09 |
| 8 | Define visual inspection. | Understand | CO 3 | AAE521.10 |
| 9 | What do you understand by production flow analysis | Remember | CO 3 | AAE521.10 |
| 10 | List the part manufacturing attributes | Remember | CO 3 | AAE521.09 |
| | | | | |
| 11 | Differentiate generative and retrieval type CAPP systems? | Remember | CO 3 | AAE521.10 |

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| 12 | Differentiate the terms precision and accuracy. | Remember | CO 3 | AAE521.11 |
| 13 | Explain with neat sketch about Retrieval CAPP system. | Understand | CO 3 | AAE521.12 |
| 14 | Explain the importance of CAPP in automation? | Understand | CO 3 | AAE521.11 |
| 15 | What do you understand by Computer Aided Process Planning? | Understand | CO 3 | AAE521.12 |
| 16 | Define traditional process planning | Remember | CO 3 | AAE521.11 |
| 17 | What do you understand by automated process planning | Understand | CO 3 | AAE521.12 |
| 18 | What is Retrieval-type CAPP systems | Understand | CO 3 | AAE521.11 |
| 19 | List the benefits of CAPP. | Remember | CO 3 | AAE521.11 |
| 20 | Define Machinability data systems | Understand | CO 3 | AAE521.12 |
| PART – B (LONG ANSWER QUESTIONS) | | | | |
| 1 | Discuss how part classification is done in the context of GT. | Understand | CO 3 | AAE521.09 |
| 2 | Discuss the advantage and disadvantages of OPITZ code system. | Remember | CO 3 | AAE521.10 |
| 3 | What is group technology? Discuss machine cell design in G.T.? | Understand | CO 3 | AAE521.09 |
| 4 | Write about Hybrid CAPP. | Remember | CO 3 | AAE521.09 |
| 5 | What are part families in group technology? Discuss machine cell design in GT. | Remember | CO 3 | AAE521.11 |
| 6 | Compare a process type layout and group technology layout for batch production of a simple component. | Understand | CO 3 | AAE521.09 |
| 7 | Discuss how part classification is done in the context of GT. | Understand | CO 3 | AAE521.09 |
| 8 | Explain MICLASS coding system in GT. | Understand | CO 3 | AAE521.10 |
| 9 | How do you overcome the difficulties in traditional process planning by adopting CAPP method? | Understand | CO 3 | AAE521.11 |
| 10 | What is computer aided process planning? Discuss variant process planning in detail with an example? | Understand | CO 3 | AAE521.09 |
| | | | | |
| 11 | Write briefly on contact inspection methods? Explain the need for automated inspection strategies in manufacturing plant | Understand | CO 3 | AAE521.09 |
| 12 | Discuss the concept and benefits of CAPP and also explain its types. | Understand | CO 3 | AAE521.10 |
| 13 | Discuss the different types of CAPP systems available in the market based on retrieval and generative types CAPP. | Understand | CO 3 | AAE521.10 |
| 14 | Explain about contact and non-contact inspection method in detail. Write down merits. | Remember | CO 3 | AAE521.09 |
| 15 | Explain computer aided testing in quality control. Explain in detail. | Remember | CO 3 | AAE521.09 |
| 16 | Explain integration of computer quality with CAD/CIM. | Remember | CO 3 | AAE521.09 |
| 17 | What is computer aided process planning (CAPP)? Discuss the data selection system in CAPP. | Remember | CO 3 | AAE521.09 |
| 18 | Explain retrieval and generative type in computer aided process planning. | Understand | CO 3 | AAE521.09 |

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| 19 | Explain optical inspection in detail. | Understand | CO 3 | AAE521.10 |
| 20 | Explain the steps involved in Production flow analysis. Explain the reason to carry out such analysis. | Understand | CO 3 | AAE521.10 |
| PART - C (ANALYTICAL QUESTIONS) | | | | |
| 1 | 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. | Understand | CO 3 | AAE521.09 |
| 2 | Discuss the importance of process planning in product development. What are the advantages? | Understand | CO 3 | AAE521.09 |
| 3 | Discuss the Principle and advantages of group technology coding. Discuss the how group technology is used in designing manufacturing cells. | Understand | CO 3 | AAE521.11 |
| 4 | What are part families in group technology? Classify a component using either OPTIZ or MICLASS system. | Understand | CO 3 | AAE521.10 |
| 5 | What is meant by a part family in Group Technology? Name and explain three parts classification and coding systems commonly used in GT. | Understand | CO 3 | AAE521.11 |
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| 6 | What is the need for CAD based process plans? Describe the structure of process plan. | Understand | CO 3 | AAE521.09 |
| 7 | What is computer aided process planning? Discuss variant process planning in detail with an example? | Understand | CO 3 | AAE521.09 |
| 8 | Explain one non-contact and one non optical inspection method with sketch. | Understand | CO 3 | AAE521.09 |
| 9 | Explain the need for automated inspection strategies in a manufacturing plant. | Understand | CO 3 | AAE521.09 |
| 10 | What is computer aided process planning (CAPP)? Explain retrieval and generative type in computer aided process planning. | Understand | CO 3 | AAE521.09 |
| UNIT – IV | | | | |
| COMPUTER AIDED PLANNING AND CONTROL, SHOP FLOOR CONTROL AND INTRODUCTION TO FMS | | | | |
| PART – A (SHORT ANSWER QUESTIONS) | | | | |
| 1 | What do you understand by Computer Aided Process Planning | Remember | CO 4 | AAE521.13 |
| 2 | Explain with neat sketch about Retrieval CAPP system. | Understand | CO 4 | AAE521.13 |
| 3 | Explain the importance of CAPP in automation? | Understand | CO 4 | AAE521.14 |
| 4 | What is the need for CAD based process plans? | Remember | CO 4 | AAE521.14 |
| 5 | What are the advantages of Process planning in manufacturing industries? | Remember | CO 4 | AAE521.13 |
| 6 | Differentiate generative and retrieval type CAPP systems? | Remember | CO 4 | AAE521.14 |
| 7 | Define the terms precision and accuracy. | Understand | CO 4 | AAE521.14 |
| 8 | Discuss the concept and benefits of CAPP and also explain its types. | Understand | CO 4 | AAE521.17 |
| 9 | What are the major elements of FMS?. Explain them | Understand | CO 4 | AAE521.14 |
| 10 | Describe the types of materials handling devices used in a FMS. | Understand | CO 4 | AAE521.17 |

PART – B (LONG ANSWER QUESTIONS)

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|----|---|------------|------|-----------|
| 1 | Discuss the need for flexibility in manufacturing in the present manufacturing scenario. | Understand | CO 4 | AAE521.13 |
| 2 | Compare FMS with transfer lines and CNC on the basis of volume and variety of parts produced.. | Understand | CO 4 | AAE521.14 |
| 3 | What is a FMC? How does FMC ensure flexibility in manufacturing? | Remember | CO 4 | AAE521.13 |
| 4 | How does a turning centre differ from an FMC? Describe the essential elements of a flexible turning cell. | Remember | CO 4 | AAE521.14 |
| 5 | .Describe the additional subsystems that make a machining centre a flexible machining system. | Understand | CO 4 | AAE521.14 |
| 6 | What are the various innovations introduced in tooling for flexible manufacturing systems? | Remember | CO 4 | AAE521.14 |
| 7 | How is tool life monitored in FMS? . | Understand | CO 4 | AAE521.14 |
| 8 | Discuss the importance of in-process monitoring of work piece quality in FMS. | Understand | CO 4 | AAE521.14 |
| 9 | What are the benefits of FMS? How is an FMS optimized? . | Understand | CO 4 | AAE521.17 |
| 10 | Discuss the relevance of FMS from the point of view of work centre utilization. | Remember | CO 4 | AAE521.17 |
| 11 | Describe the principle of an automated storage and retrieval system. | Remember | CO 4 | AAE521.16 |
| 12 | Discuss the importance of materials handling system in FMS. | Understand | CO 4 | AAE521.14 |
| 13 | Discuss the various modules of purchase management software. What is the significance of bill of materials? | Remember | CO 4 | AAE521.14 |

PART - C (ANALYTICAL QUESTIONS)

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|---|---|------------|------|-----------|
| 1 | How do you overcome the difficulties in traditional process planning by adopting CAPP method? | Understand | CO 4 | AAE521.14 |
| 2 | What is computer aided process planning? Discuss variant process planning in detail with an example? | Understand | CO 4 | AAE521.15 |
| 3 | Write briefly on contact inspection methods? Explain the need for automated inspection strategies in manufacturing plant | Understand | CO 4 | AAE521.16 |
| 4 | Discuss the different types of CAPP systems available in the market based on retrieval and generative types CAPP. | Understand | CO 4 | AAE521.16 |
| 5 | Explain about contact and non-contact inspection method in detail. Write down merits. | Understand | CO 4 | AAE521.16 |
| 6 | 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. | Understand | CO 4 | AAE521.14 |
| 7 | Discuss the importance of process planning in product development. What are the advantages? | Understand | CO 4 | AAE521.17 |
| 8 | Discuss the Principle and advantages of group technology coding. Discuss the how group technology is used in designing manufacturing cells. | Understand | CO 4 | AAE521.16 |
| 9 | What is computer aided process planning? Discuss variant process | Understand | CO 4 | AAE521.16 |

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| | planning in detail with an example? | | | |
| 10 | Explain one non-contact and one non optical inspection method with sketch. | Understand | CO 4 | AAE521.16 |
| 11 | What is computer aided process planning (CAPP)? Explain retrieval and generative type in computer aided process planning. | Understand | CO 4 | AAE521.17 |

UNIT-V

COMPUTER AIDED PLANNING AND CONTROL AND COMPUTER MONITORING

PART - A (SHORT ANSWER QUESTIONS)

| | | | | |
|----|--|------------|------|-----------|
| 1 | What is master schedule accommodate flexibility in manufacturing? | Understand | CO 5 | AAE521.20 |
| 2 | How does shop floor monitoring help in meeting delivery schedules? | Understand | CO 5 | AAE521.21 |
| 3 | Discuss the inventory management vis-à-vis just in time manufacture. | Understand | CO 5 | AAE521.20 |
| 4 | Why is master schedule important? How does master schedule accommodate flexibility in manufacturing? | Remember | CO 5 | AAE521.21 |
| 5 | How does shop floor monitoring help in meeting delivery schedules? | Understand | CO 5 | AAE521.21 |
| 6 | Discuss the inventory management vis-à-vis just in time manufacture. | Understand | CO 5 | AAE521.20 |
| 7 | Why CIM integration of all activities of industry. | Understand | CO 5 | AAE521.20 |
| 8 | Explain the basic structural model of manufacturing process | Understand | CO 5 | AAE521.21 |
| 9 | Why is enterprise resource planning a holistic approach to manufacturing planning? | Understand | CO 5 | AAE521.21 |
| 10 | What are the important sub-modules of a materials requirements planning software? | Understand | CO 5 | AAE521.20 |
| 11 | Explain the different types of process control stages. | Remember | CO 5 | AAE521.21 |
| 12 | Discuss the difference between the Distributed control and central control used in computer process control. | Understand | CO 5 | AAE521.21 |
| 13 | Explain CIM in terms of flexibility. | Understand | CO 5 | AAE521.20 |
| 14 | Define computer integrated manufacturing system (CIM). | Remember | CO 5 | AAE521.21 |
| 15 | Explain types of manufacturing system in detail. | Understand | CO 5 | AAE521.21 |
| 16 | List out material handling systems. | Understand | CO 5 | AAE521.21 |
| 17 | What is computer control involved in CIM. | Understand | CO 5 | AAE521.20 |
| 18 | Explain human labor in the manufacturing systems. | Remember | CO 5 | AAE521.21 |
| 19 | What is a CIM wheel? Sketch the CIM wheel. | Understand | CO 5 | AAE521.21 |

PART - B (LONG ANSWER QUESTIONS)

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| 1 | Explain in detail the different types of database requirements in CIM. Discuss the integration of CAD database and CMM operation | Understand | CO 5 | AAE521.20 |
| 2 | Describe hardware configuration of CIM with the help of a sketch. | Understand | CO 5 | AAE521.21 |
| 3 | Discuss the possible computer applications in Manufacturing Planning activities. | Understand | CO 5 | AAE521.20 |
| 4 | Discuss the role of CAPP in CIM in detail. | Understand | CO 5 | AAE521.21 |

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| 5 | Explain CIM integration of all activities of industry. | Understand | CO 5 | AAE521.20 |
| 6 | Discuss the role of CAPP in CIM in detail. | Understand | CO 5 | AAE521.21 |
| 7 | Discuss the possible computer applications in Manufacturing Planning activities. | Understand | CO 5 | AAE521.20 |
| 8 | Explain CIM integration of all activities of industry. | Understand | CO 5 | AAE521.21 |
| 9 | Explain different functions of CIM? | Understand | CO 5 | AAE521.20 |
| 10 | Explain in detail the integration of CAD, CIM, CAE and CAPP systems in CIM Environment. | Understand | CO 5 | AAE521.21 |
| 11 | What is the different control system used in CIM. | Understand | CO 5 | AAE521.20 |
| 12 | Discuss the involvement of human labour in various manufacturing systems. | Understand | CO 5 | AAE521.21 |
| 13 | Write a note on need, evolution and elements of CIM. | Understand | CO 5 | AAE521.20 |
| 14 | Explain in the details the different data files in CIM and the system reports Generated by CIM. | Understand | CO 5 | AAE521.21 |
| 15 | Why are the unskilled labours replaced with skilled labours in computer integrated manufacturing systems? Justify. | Understand | CO 5 | AAE521.20 |
| 16 | Discuss its strength and weakness as an elucidator of CIM's scope. | Understand | CO 5 | AAE521.21 |
| 17 | Discuss the possible computer applications in Manufacturing Planning activities. | Understand | CO 5 | AAE521.20 |
| 18 | Why CIM integration of all activities of industry. Justify. | Understand | CO 5 | AAE521.21 |
| 19 | Explain materials handling and system and explain the three any materials handling system | Understand | CO 5 | AAE521.20 |
| 20 | Explain machine tools and related equipment's in computer integrated Manufacturing | Understand | CO 5 | AAE521.21 |
| PART - C (ANALYTICAL QUESTIONS) | | | | |
| 1 | Why are the unskilled labours replaced with skilled labours in computer integrated manufacturing systems? | Understand | CO 5 | AAE521.20 |
| 2 | Explain the different types of computer control systems used in CIM. | Understand | CO 5 | AAE521.21 |
| 3 | What is a material requirement planning? Explain the various inputs to the MRP system? | Understand | CO 5 | AAE521.20 |
| 4 | Explain in the details the different data files in CIM and the system reports generated by CIM. | Understand | CO 5 | AAE521.21 |
| 5 | Describe a materials handling and system and explain the three any materials handling system | Understand | CO 5 | AAE521.20 |
| 6 | What is a CIM wheel? Discuss its strength and weakness as an elucidator of CIM's scope. | Understand | CO 5 | AAE521.21 |
| 7 | Describe hardware configuration of CIM with the help of sketch. | Understand | CO 5 | AAE521.20 |
| 8 | Explain CIM integration of all activities of industry. | Understand | CO 5 | AAE521.21 |
| 9 | Discuss the possible computer applications in Manufacturing Planning activities | Understand | CO 5 | AAE521.20 |
| 10 | Explain the applying and advantages of integration of CIM with CAD/CIM | Understand | CO 5 | AAE521.21 |

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