**14ME704**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **Jan/Feb, 2021** | **Mechanical Engineering** | | |
| **Seventh Semester** | **CAD/CAM** | | |
| **Time:** Three Hours | | **Maximum :** 60 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X12 = 12 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X12=48 Marks) |
| **Part - A** | | | |

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| 1 | Answer all questions | | (1X12=12 Marks) | | |
|  | a) | List the line drawing algorithms. | | |  |
|  | b) | What is concatenation? | | |  |
|  | c) | Represent the matrix used for determining the new position of an object after rotation about y axis by an angle Ɵ. | | |  |
|  | d) | What are the characteristics of B-spline? | | |  |
|  | e) | What is clipping? | | |  |
|  | f) | What are the advantages of CSG system? | | |  |
|  | g) | How do you classify NC systems? | | |  |
|  | h) | Distinguish between direct numerical control and distributed numerical control. | | |  |
|  | i) | State the advantages of numerical control. | | |  |
|  | j) | Name the methods of grouping parts into families. | | |  |
|  | k) | What is a machine cell? | | |  |
|  | l) | State the two approaches for CAPP. | | |  |
| **Part - B** | | | | | |
| 2 | a) | Write the differences between Random scan and raster display systems. | | 6 M | |
|  | b) | What are 2D and 3D transformations? Write the transformation matrices for translation, scaling, rotation? | | 6 M | |
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| 3 | a) | Illustrate the construction and working of cathode ray tube. | | 6 M | |
|  | b) | The radius of a circle is 8 units, and center point coordinates are (0, 0). Apply Bresenham’s circle drawing algorithm to plot all points of the circle. | | 6 M | |
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| 4 | a) | The coordinates of four points are given by P0 = [2 2 0]T, P1 = [2 3 0]T, P2 = [3 3 0]T and P3 = [3 2 0]T. Find points on the Bezier curve. Also find points on the curve for u = 0, 0.25, 0.5, 0.75 and 1. | | 6 M | |
|  | b) | Explain cubic spline curve in detail? | | 6 M | |
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| 5 | a) | Find the equation of cubic B-spline curve defined by the control points P0 = [2 2 0]T,  P1 = [2 3 0]T, P2 = [3 3 0]T and P3 = [3 2 0]T. | | 6 M | |
|  | b) | What is rendering? What are the different stages of rendering an image? | | 6 M | |
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| 6 | a) | Discuss about the basic components of NC system. | | 6 M | |
|  | b) | What do you understand by APT language and discuss its statements. | | 6 M | |
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| 7 | a) | Explain the features of CNC machine. | | 6 M | |
|  | b) | Explain manual part programming with suitable example. | | 6 M | |
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| 8 | a) | Discuss about FMS layout configurations. | | 6 M | |
|  | b) | Explain the Opitz coding system. | | 6 M | |
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| 9 | a) | Explain the functions performed by the FMS computer control system. | | 6 M | |
|  | b) | Discuss about Production Flow Analysis, steps in PFA and its weakness. | | 6 M | |

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**SCHEME OF VALUATION**

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| 1 | Answer all questions, Each question carries: **1 Mark** | | (1X12=12 Marks) | |
| **UNIT I** | | | | |
| 2 | a) | Differences between Random scan and raster display systems: **6 Marks** | | 6 M |
|  | b) | Reflection about the line Y = – X : **2 Marks**  Equivalent to a reflection relative to the Y-axis, followed by a counter-clockwise rotation of 90° : 4 **Marks** | | 6 M |
| **(OR)** | | | | |
| 3 | a) | Construction **3 Marks**  Working of cathode ray tube: **3 Marks** | | 6 M |
|  | b) | Bresenham’s circle drawing algorithm: 3 **Marks**  Problem solving and ploting all points of the circle: 3 **Marks** | | 6 M |
| **UNIT II** | | | | |
| 4 | a) | Find points on the Bezier curve. Also find points on the curve for u = 0, 0.25, 0.5, 0.75 and 1. : 6 **Marks** | | 6 M |
|  | b) | Explain Z-buffer method for hidden surface removal: 3 **Marks** | | 6 M |
| **(OR)** | | | | |
| 5 | a) | Find the equation of cubic B-spline curve: 6 **Marks** | | 6 M |
|  | b) | Rendering: 2 **Marks**  Different stages of rendering an image: 4 **Marks** | | 6 M |
| **UNIT III** | | | | |
| 6 | a) | Basic components of NC system. (Tape, MCU and Machine Tool: Diagram **3 Marks**, Explanation: 3 **Marks)** | | 6 M |
|  | b) | APT program  Geometric statements: 2 **Marks**  Motion statements: 2 **Marks**  Auxiliary ststements: **1 Mark**  Postprocessor ststements: **1 Mark** | | 6 M |
| **(OR)** | | | | |
| 7 | a) | Features of CNC machine: 6 **Marks** | | 6 M |
|  | b) | Manual part program : 6 **Marks** | | 6 M |
| **UNIT IV** | | | | |
| 8 | a) | FMS layout configurations. (Diagrams: **3 Marks**, Explanation: **3 Marks**) | | 6 M |
|  | b) | Opitz coding system: 6 **Marks** | | 6 M |
| **(OR)** | | | | |
| 9 | a) | Functions performed by the FMS computer control system: 6 **Marks** | | 6 M |
|  | b) | Production Flow Analysis: **2 Marks**  Steps in PFA: **3 Marks**  Weakness: **1 Mark** | | 6 M |