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MAY-25-0433

ME-601 (Computer Aided Design and Manufacturing  
(CAD/CAM))

B.Tech-6th (CBCS)

Time : 3 Hours

Max. Marks : 60

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note:** Attempt five questions in all, select one question each from section A, B, C, D. Section E (Question-9) is compulsory.

### Section A

1. (a) What are the reasons for implementing CAD/CAM applications in the design and manufacturing process? Explain briefly. (5)
- (b) Why is 3D modeling important? Explain the limitations of wire-frame modeling over solid modeling. (5)
2. (a) Briefly discuss the applications of computers to the design process. (5)
- (b) What hardware components are necessary for running CAD drafting packages efficiently, and how do they impact overall system performance? (5)

### Section B

3. A line in two-dimensional space has endpoints defined by  $(1, 1)$  and  $(1, 3)$ . It is desired to move this line by a series of transformations so that its endpoint will be at  $(0, 1)$  and  $(0, 5)$ .
  - (a) Describe the sequence of transformations required to accomplish the movement of the line as specified.

- (b) For each transformation in the sequence, write the transformation matrix. (10)
4. The coordinates of four control points relative to a current WCS are given by:
- $P_0 = [2 \ 2 \ 0]^T$ ,  $P_1 = [2 \ 3 \ 0]^T$ ,  $P_2 = [3 \ 3 \ 0]^T$ ,  $P_3 = [3 \ 2 \ 0]^T$ . Find the equation of the resulting Bezier curve. Also, find point on the curve for  $u = 0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$  and 1. (10)

### Section C

5. Compare the advantages and disadvantages of C-rep and B-rep approaches in solid modeling. (10)
6. Classify the NC machine tools and illustrate the features of each classification. (10)

### Section D

7. (a) Write a short note on the types of manufacturing systems. (5)
- (b) Explain the steps followed in Retrieval-type CAPP system. (5)
8. Briefly explain the components of the flexible manufacturing system. Discuss types of FMS. (10)

### Section E

9. (a) List the benefits of Group Technology.
- (b) Deliberate on CAD/CAM tools.
- (c) Enlist the advantages of the Wire Frame model.
- (d) Illustrate mirror transformation.

- (e) Give the practical applications of the B-spline and Bezier curve.
- (f) Write a brief note on viewports.
- (g) Exemplify Computer-Aided Process Planning.
- (h) What is tool offset in CNC machines?
- (i) Write a short note on CSG.
- (j) What is meant by Raster Scan technique? (10×2=20)