Dec-25-0230

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 one questions each from Section A, B, C and D. Q. No. 9 is compulsory. Any missing data may be assumed appropriately.

SECTION - A

1. (a) Briefly explain the various steps involved in a design process and the role of computers in design and manufacturing. (5)

    (b) Differentiate between variational and feature-based modelling. (5)

2. Name any four basic geometrical entities. Enumerate at-least five methods of defining each of these entities in a typical 2-D CAD software. Explain how basic graphic entities are used to create a model. (10)

SECTION - B

3. Consider the line $L > \begin{vmatrix} 1 & 3 \\ 2 & 2 \end{vmatrix}$, carry out the following transformations:

    (a) Scale by a factor of 3.

    (b) Rotate the line about origin by 60°.

    (c) Translate the line in space by [2 3]. (10)

---

2   **ME-601**

4. A cubic spline curve is defined by the equation $P(u) = C_3u^3 + C_2u^2 + C_1u + C_0$, $0 \le u \le 1$ where C_3, C_2, C_1, and C_0 are the polynomials coefficients. Find the four control points that define an identical Bezier curve. (10)

SECTION - C

5. Discuss and illustrate graphically

    (a) NC systems and machines (b) CNC machines (c) DNC machines. (10)

6. Enumerate the distinct advantages of computer assisted part programming. Highlight features of manufacturing module of a popular CAD module. (10)

SECTION - D

7. (a) Chart out the general procedure of finite element analysis. (5)

    (b) Illustrate using a layout the components of a typical FMS. (5)

8. What is meant by group technology? Discuss the advantages of integrating group technology concepts with a flexible manufacturing system. (10)

SECTION - E (Compulsory)

9. (a) Exemplify the sweep operation in solid modeling.

    (b) Enlist the advantages of CNC over NC.

    (c) Illustrate graphically the PTP and continuous path machining.