B. TECH
(SEM-VII) THEORY EXAMINATION 2022-23
COMPUTER AIDED DESIGN AND MANUFACTURING

Time: 3 Hours   *Total Marks: 70*

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   **2*7 = 14**

   (a)   List the advantages of Bresenham's line algorithm.
   (b)   What is Bezier Curve? Write its purpose.
   (c)   Write the full form of IGES. Define IGES.
   (d)   Differentiate between CNC and DNC machines.
   (e)   Explain the concept of FEM.List the limitation of finite element method.
   (f)   Define robot. Discussthe various types of robot configurations.
   (g)   Define JIT.

SECTION B

2.   **Attempt any *three* of the following:**   **7*3 = 21**

   (a)   Illustrate the Bresenham's circle algorithm.
   (b)   Differentiate between constructive solid geometry (CSG) and boundary representation (B-rep).
   (c)   Differentiate between linear and circular interpolation. Explain each term in following block of information- N035, G90, G02, X40, Y52.5, I15, and J25.
   (d)   Compare NC machines and Robots. Discuss the various types and generations of robots with applications.
   (e)   What is rapid prototyping? What is the Basic principles and advantages of rapid prototyping (RP)? Explain the need, General features and classificationsof different RP techniques.

SECTION C

3.   **Attempt any *one* part of the following:**   **7*1 = 7**

   (a)   A triangle ABC having vertices A (1, 1), B (1, 7) and C (5, 4) is scaled by 3 units in X direction and then rotated by 30 degree in anticlockwise direction keeping point (1, 1) fixed. Find the transformation matrix.
   (b)   Generate the Bezier curve for the following control points: A (1, 1), B (4, 3), C (5, 2) and D (3, 1).

4.   **Attempt any *one* part of the following:**   **7*1 = 7**

   (a)   Discuss the general procedures of FEM in engineering design problems. Also write the applications of FEM.
   (b)   State the advantages of FEM.Derive quadratic shape functions for 1-D element.

5.   **Attempt any *one* part of the following:**   **7*1 = 7**

    (a)   Write the short notes on the following:
        (i) Automated guided vehicles(AGVs)
        (ii) NC machines
    (b)   Illustrate the manual part programming. Explain the types of formats of manual part programming.

6.   **Attempt any *one* part of the following:**   **7*1 = 7**

    (a)   What is CAPP? Discuss the various types of CAPP systems.
    (b)   Discuss the following terms:
        (i)Master production schedule
        (ii)MRP
        (iii) ERP

7.   **Attempt any *one* part of the following:**   **7*1 = 7**

    (a)   Write the short notes on the following:
        (a) Group technology(GT)
        (b) Flexible manufacturing systems(FMS)
    (b)   Discuss the three representative Rapid prototyping (RP) techniques.