Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech.(CAD/CAM) (Sem.–1)

COMPUTER AIDED DESIGN

Subject Code : ME-501

M.Code : 23505

Time : 3 Hrs. **Max. Marks : 100**

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a) With a neat flowchart, discuss the different steps in designing process in product life cycle. (10)

   b) What is reverse engineering? Discuss any tool that is used for reverse engineering of any component. (10)

2. a) Derive the expression for radius and center of a circle passing through three given points. Assume the given points as PI, P2 and P3. (10)

   b) Discuss the different types of graphics output devices used in CAD/CAM applications. (10)

3. a) Derive the equation for a closed cubic B-Spline curve with four control points. Calculate a point on this curve at u=0.5 for (5, 10), (10, 15), (15, 10) and (10, 5) as control points. (14)

   b) What are intrinsic and parametric representation of curves? Discuss the advantages of each of these curves. (6)

4. a) Assuming all the parameters, derive the equation needed to calculate the 'surface area' type of geometrical property for a bounded surface. (10)

   b) Giving the parametric equations, discuss the Coons surface used in CAD. (10)

5. a) Find the distance between two points which are on two separate surfaces. The points are on plane surface and ruled surface respectively at u=0.5 and v=0.7. The plane surface is given by three control points *i.e.*, (3, 3), (10, 3) and (4, 10). The ruled surface is given by boundaries of a Cubic Spline and a Bezier curve. The Cubic Spline is defined by control points (9, 11) and (14, 16). The tangent vectors are at 45° and 30° respectively at the two control points. The Bezier curve is given by control points (10,20), (12, 22), (14, 25), (16, 25) and (18,27). (14)

   b) Differentiate between wireframe models, surface models and solid models. (6)

6. a) What are the different properties that a solid modeling representation scheme should possess? (6)

   b) Discuss in detail, the bounded and unbounded types of CSG representation scheme. (14)

7. Discuss in detail, the following types of solid representation schemes :

   a) Boundary representation (10)

   b) Analytical Solid modeling (10)

8. a) Why is the data exchange format required? Discuss the different types of data exchange formats used in CAD industry. (10)

   b) Giving the parametric equation, discuss the characteristics of Bezier curve used in CAD. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.