Roll No. | | | | | | | | | | | | |

Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(ME) (Sem.–2)

COMPUTER AIDED DESIGN

Subject Code : MME-506

Paper ID : [E0422]

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) Discuss the role of computers in the design process.
   b) What are the advantages and disadvantages of the various interactive input devices?
2. a) Briefly explain the various techniques that can be used for image generation on computer terminals.
   b) What do you understand by reverse engineering? How is CAD useful in this process?
3. a) Show that the mid-point of a line transforms to the mid-point of the transformed line.
   b) A point is rotated about the Z axis by two successive angles θ_1 and θ_2. Show that this is equivalent to rotating the point about the same axis once with an angle $\theta = \theta_1 + \theta_2$.
4. a) How is surface modeling different from wireframe modeling? Explain briefly with the help of examples.
   b) Draw a Bezier spline for the following control points :

   (0, 0), (4, 3), (8, 4) and (12, 0)
5. What is Constructive Solid Geometry (CSG)? Discuss in detail the steps required to construct a meaningful solid object by primitives and Boolean operators taking a suitable example.
6. a) What is parametric programming? What is the advantage of parametric programming in designing curves and surfaces?
   b) Discuss the essential requirements of CAD and CAM integration. What are the difficulties encountered in this process?
7. a) How are hidden line and hidden surface algorithms classified? Explain each one of them briefly.
   b) Given a point P = (2, 4, 8) and using the homogeneous representation, calculate the coordinates of the transformed point P* if P is rotated about the X, Y and Z axes by 30°, 60° and 90° respectively.
8. Write short notes on :
   a) Selective Laser Sintering
   b) 3-D concatenation
   c) Rendering
   d) Half spaces