

(3 Hours)

[Total Marks : 100]

T.E. Sem-6 (Rev.) - Computer

30/12/08

N.B. : (1) Question No.1 is **Compulsory**.(2) Attempt any **four** questions out of remaining **six** questions.

1. (a) Write short notes on Character Generation. 20
 (b) Show that the two curves $r(t) = (t^2 - 2t, t)$ & $n(t) = (t^2 + 1, t + 1)$ are both C^1 & G^1 Continuous where they join at $r(1) = n(0)$.
Note : C^n -parametric Continuity and G^n -Geometric Continuity
 (c) Prove the two successive rotation are additive $R(\theta_1).R(\theta_2) = R(\theta_1 + \theta_2)$.
 (d) Write detail notes on: Frame Buffer organization.
2. (a) Consider the line from (0, 0) to (6, 7). Use Bresenham algorithm to rasterize the line. 10
 (b) Given a clipping window A(20, 20), B(60, 20), C(60, 40), D(20, 40). Using Cohen Sutherland line clipping algorithm. Find the visible portion of the line segment joining the points P(40, 80) , Q(120, 30). 10
3. (a) Derive the mapping for any given point (X_w, Y_w) from the window onto the View port. 10
 (b) Consider the line with co-ordinate A (1, 1) & B(10, 10). 10
 In case-1, first reflect the line about Y-axis and then about the $Y = -X$.
 In case-2, simply rotate the line by 270° prove that transfer object in both the cases is same.
4. (a) Derive all blending function for a Bezier curves with 6 control point. 10
 (b) Give the mathematical description of the perspective projection. 10
5. (a) Explain the steps use in Bresenham circle algorithm & Write a C program for the same. 10
 (b) Compare Boundary fill and Flood fill algorithm. Write a function to fill a region whose boundaries are of different color using 8 connected approach. 10
6. (a) Differentiate between text mode and graphics mode. Explain how to initialize the system in graphic mode in C language. 10
 (b) Write and explain the Depth-Buffer algorithm for detecting visible surface. 10
7. Differentiate between [Any Four] :— 20
 - (a) Guard shading and Phong shading.
 - (b) Image space and object space.
 - (c) Half toning and dithering technique.
 - (d) Diffuse reflection and Specular reflection.
 - (e) Quad tree and Octree.
 - (f) Raster scan display & Random scan display.