

**B.Tech. Degree V Semester Examination
January 2002**



**ME 503 COMPUTER GRAPHICS
(1999 Admissions)**

Time: 3 Hours

Maximum Marks: 100

- I. (a) Distinguish between vector and raster graphics display. Suggest application areas for which each class of devices is best suited. (10)
 (b) What do you mean by frame buffer? Describe the method of producing different colors on CRT monitor considering a simple color raster frame buffer. (10)
OR
- II. (a) Describe the organization of a 3-bit plane frame buffer and the possible color combinations. Illustrate the use of look-up tables. (10)
 (b) Briefly explain different input and output devices. Distinguish between a light pen, tablet and a mouse as cursor control devices. (10)
- III. (a) Derive the transformation for reflection with respect to a line $y = 3x$. (12)
 (b) The vertices of a triangle ABC has co-ordinates $A_{(50, 50)}$, $B_{(100, 0)}$ and $C_{(0, 0)}$. Determine the co-ordinates of the vertices if the triangle is scaled down to 10% its size in both x and y directions and then rotated anti-clockwise with respect to the origin by 60° . (8)
OR
- IV. (a) Distinguish between geometric transformation and co-ordinate transformation with a suitable example. (10)
 (b) Write short notes on shearing and homogeneous co-ordinates. (10)
- V. (a) Derive the transformation matrix required for isometric projection. Explain stereographic projection. (12)
 (b) Compare orthographic projection and perspective projection taking an example of a cube. (8)
OR
- VI. (a) Derive the transformation matrix for rotation about any arbitrary axis in space. (12)
 (b) Briefly explain different techniques for generating perspective views. (8)
- VII. (a) Differentiate between parametric and non-parametric representation of curves. (10)
 (b) Differentiate between curve 'fitting' and curve 'fairing' taking an example each. (10)
OR
- VIII. (a) Explain the characteristics of Bezier curves. What are the advantages of B-spline curves over Bezier curves? (12)
 (b) Explain B-spline blending functions. (8)
- IX. (a) Differentiate between surfaces of revolution and sweep surfaces taking one example each. (10)
 (b) Name the natural quadric surfaces. Give an expression for a general quadric surface. (10)
OR
- X. Write short notes on **ANY FOUR** of the following: (4 x 5 = 20)
- (i) Cubic splines
 - (ii) Ruled and developable surfaces
 - (iii) Rational B-spline curve
 - (iv) Animation
 - (v) Oblique projections