

## ***B.Tech. Degree V Semester Examination, November 2009***

### **ME 503 COMPUTER GRAPHICS**

(1999 Scheme)

Time: 3 Hours

Maximum Marks: 100

- I. (a) Describe the organization of a 3-bit plane frame buffer and the possible colour combinations. Illustrate the use of look up tables. (10)  
(b) Discuss about various graphic input devices. (10)  
**OR**
- II. (a) Distinguish between vector and raster graphics display and suggest application areas for each of them. (10)  
(b) Discuss the different types of display devices. (10)
- III. (a) Distinguish between geometric transformation and co-ordinate transformation with a suitable example. (10)  
(b) Find the transformation to perform  $45^\circ$  rotation of triangle A(0,0), B(1,1), C(5,2) about the point P(-1,-1). (10)  
**OR**
- IV. (a) Find the transformation matrix for reflection about a line 'L' with slope 'm' and 'y' intercept (0,6). (12)  
(b) Briefly explain instance transformations. (8)
- V. (a) Prove that rotation about two axes are not commutative. (10)  
(b) Derive the transformation matrix required for oblique projection onto the xy plane. (10)  
**OR**
- VI. (a) Derive the transformation matrix for rotation about any arbitrary axis in space. (12)  
(b) Briefly explain any two techniques for generating perspective views. (8)
- VII. (a) What are the advantages of parametric representation in comparison with non-parametric representation for curves? (10)  
(b) Comment on Cubic Splines and parabolic blending functions. (10)  
**OR**
- VIII. (a) Show that the  $n^{\text{th}}$  degree B-spline basis function  $B_{i,n}(x)$  satisfy  $B_{i,n}(x) = 0$  if  $x < t_i$  or  $x > t_{i+n+1}$ . (12)  
(b) Briefly explain Spline interpolation. (8)
- IX. (a) Explain the need for piecewise surface representation. Discuss ruled and developable surfaces. (12)  
(b) Explain the interpolation of surface patches. (8)  
**OR**
- X. Write short notes on:  
(a) Curve filling and curve fairing  
(b) Surface of revolution  
(c) Bezier surfaces  
(d) Quadric surfaces. (4 x 5 = 20)

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