

2006 CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING(C-DAC) M.C.A

**END-TERM EXAMINATION
SECOND SEMESTER [MCA] – MAY 2006
COMPUTER SYSTEM ARCHITECTURE**

Paper Code: MCA-106

Time: 3 Hours

Marks: 60

Q. 1 Describe the following in brief :- (3 x 5 = 15)

- (a) QUADRATIC SURFACES
- (b) RGB Color Models.
- (c) BSP Tree
- (d) Solid Modeling
- (e) Principal Vanishing Point

Q. 2 (a) What is the advantage of using homogenous coordinates? Consider the square (0,0), (0,2), (2,0), (2,2). Perform a composite transformation of the square by using the following steps. (Give the coordinates of the square at each intermediate steps.)

- (i) Scale by using $S_x = 2$ and $S_y = 3$.
- (ii) Rotate of 45° in the anticlockwise direction.
- (iii) Translate by using $T_x = 3$ and $T_y = 5$. (6)

- (b) Describe B-Splines and their application in detail. (4)
- (c) What do you understand by intensity interpolation? Explain Gouraud shading. (5)

SECTION -B

Q. 3 (a) Discuss Bresenham's Circle Drawing algorithm. Trace the algorithm to determine first TEN points of the circle $x^2 + y^2 = 25$. (6)

b) Discuss Z-Buffer algorithm in detail. (4)

Q. 4 (a) Define Scissoring Process. Describe Cohen-Sutherland Line Clipping algorithm in details. (6)

(b) Write the empirical model for calculating specular reflection range given in the Phong Model. (4)

Q. 5 (a) Determine the Bezier Curve with four control points. Discuss the importance of Bernstein Polynomials. (10)

Q. 6 (a) Discuss Julia Set and Mandelbrot set. (5)

(b) Why are hidden surface algorithm needed? Explain Oct-trees method for visible surface determination. (5)

Q. 7 (a) What are the applications of fractals in computer generated graphics? (3)

(b) How can sweeps be used for solid modeling? Discuss their limitations and possible methods to overcome these. (5)

(c) What is Ray Tracing? (2)

Q. 8 (a) How can a 3-D object be viewed by human eyes? Differentiate between different method? (4)

(b) If you were an architect and needed to determine the dimensions of an object, which projection would you use and why? Classify these projections.(6)

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