

(Please write your Exam Roll no)

Exam Roll No.....

# END TERM EXAMINATION

THIRD SEMESTER [MCA] December 2011

Paper Code: MCA 203

Subject: Computer Graphics

Time : 3 Hours

Maximum Marks : 60

Note: Q. No. is compulsory. Attempt one question from each Unit

- Q1. Answer the following: (2X10=20)
- a) Aliasing & Anti Aliasing
  - b) Geometric & coordinate Transformation
  - c) Blending function
  - d) Uniform, Open Uniform & Non Uniform Knot vector
  - e) Gouraud Shading
  - f) CSG (Constructive Solid Geometry)
  - g) Foreshortening Factor
  - h) Convex Hull Property of Bezier Curve
  - i) Write transformation Matrix for reflection of an object about X-axis & Y-axis
  - j) Lambert's Cosine Law

## Unit -I

- Q2. a) What is DDA Algorithm? How we can improve the performance of DDA Algorithm? (2)
- b) Write Midpoint circle generation algorithm (3)
- c) Reflect diamond shaped polygon whose vertices are A(-1,0), B(0,-2) C(1,0) and D(0,-2) about the horizontal line Y=2. (5)
- Q3. a) Write Brasenham's line drawing algorithm. Consider the line from (20,10) to 30,18). Use the Brasenham's algorithm to rasterize the line. (5)
- b) Magnify the triangle with the vertices A(0,0), B(1,1), and C(5,2 ) to twice its size while keeping C(5,2) fixed. (5)

## Unit II

- Q4 a) What is Cubic Bezier Curve? Construct the Bezier Curve of order 3 with four polygon vertices A(1,1), B(2,3),C(4,3 ), and D (6,4). (5)
- b) What is continuity Condition for Bezier Curve? Explain parametric & geometric condition with Example. (5)
- Q5. a) What is B-Spline? Explain Cubic B-Spline in detail. (5)
- b) i) Write the properties of Bezier and B-Spline Curve.

ii) A cubic Curve defined by the points(1,1) , (2,3), (4,4) and (6,1). Calculate the co-ordinates of parametric midpoint of this curve and verify that its gradient  $dy/dx$  is  $\frac{1}{4}$  at this point. Sketch the curve? (5)

### Unit III

- Q6. a) Explain the Cohen Sutherland line Clipping Algorithm. Use Cohen Sutherland Line Clipping to clip the line P(70,20) and (100,10) against a window lower left hand corner (50,10) and upper right corner (80,40). (5)
- b) What is projection? Explain parallel projection along with projection matrix. (5)
- Q7. a) What is purpose of vanishing point in perspective projection? Explain one point, two point and three point Perspective Projections. (5)
- b) Distinguish between Octree & BSP tree method of representing solid objects with suitable illustrations. (5)

### Unit -IV

- Q8. a) How Shadow could be generated using ray tracing technique? Difference between Phong Shading & Phong illumination. (5)
- b) Write algorithm for z-Buffer hidden surface method, How Z-Buffer technique could be adopted to manage display of overlapping windows? (5)
- Q9. a) How does Painter's Algorithm determine the hidden Surface? What are the advantages or disadvantages for implementing this algorithm? (5)
- b) Write an algorithm for phong Shading and discuss its advantages and disadvantages over Gouraud Shading . (5)

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