Roll No _____ **Examination May-2014** Total no of page-2

MCA-4th Semester

MCA- 403 Interactive Computer Graphics

Time Allowed: 3 Hours Max. Marks: 100

Note: Attempt 5 question selecting one from each Section, Section –E is compulsory.

Section – A

1.1 With help of Diagram explain the Architecture of Raster Graphics system with display processor? Explain which is better Raster or Random Scan System. 10

1.2 Write note on RGB and CMY color models? 10

2.1 Explain the various color generation techniques. Also point out which one is best and explain why? 10

2.2 Explain the working of following graphics devices: 10

i) Light pen
ii) Joystick
iii) Tablets
iv) Digitizers
v) Data Gloves

Section – B

3.1 Develop the Bresenham's circle generation algorithm to draw an octant of the circle (one eighth of a circle) with centre (0,0) and radius R. The octant starts from the point (O,R) and lies in the first quadrant. 10

3.2 Perform a 45 degree rotation of triangle A(0,0), B(1,1), C(5,2) 10

i) About origin
ii) About P(-1,-1)

4.1 What is viewing transformation? Give 2D- viewing transformation pipeline? Derive window –to-viewport coordinate transformation? 10

4.2 Describe Sutherland-Hodgeman Polygon clipping. Explain with one example. 10

Section – C

5.1 Define Projections? Write complete classification of projection? 5

5.2 Derive the general perspective transformation onto a plane with reference point R0(x0,y0,z0), normal vector N=n1I+n2J+n3K, and using C(a,b,c) as the center of projection. 15

6.1 Find a Transformation Av which aligns a given vector Y with the vector K along the positive z axis? 12

6.2 What are Bezier curves? Write basic properties of Bezier curves 8

Section – D

7.1 What do you understand by diffuse reflections? Briefly explain the significance of Diffuse reflection coefficient computations of diffuse reflections. 10

7.2 What are hidden surfaces? Write Z-Buffer algorithm? 10

8.1 What is surface rendering? Explain in brief the following shading methods: 15

i. Gouraud Shading
ii. Phong Shading
iii. Constant intensity

8.2 Write note on morphing of objects? 5

Section- E

9 Write in Short: 2*10

1. Affine Transformations
2. Application of graphics
3. Properties of B-Spline curves
4. Color Look up tables
5. Shearing

6. Define Fractals
7. Homogenous coordinate system
8. Need of Scan Conversion
9. Distinguish between convex and concave polygons?
10. What is scan line algorithm?

End