LAST MOMENT TUITIONS

# Computer Graphics

## May 18

### Computer Engineering (Semester 4)

**Total marks: 80**
**Total time: 3 Hours**

*INSTRUCTIONS*
*(1) Question 1 is compulsory.*
*(2) Attempt any **three** from the remaining questions.*
*(3) Draw neat diagrams wherever necessary.*

**Q1(a)** Explain CSG method for solid modeling. (5)

**(b)** What is aliasing and Explain any one antialiasing method. (5)

**(c)** Compare Raster Scan and Random Scan displays. (5)

**(d)** Prove that two successive rotations are additive
i.e. $R1(o_1)*R2(o_2o1)*R2(o2) = R(o_1+o_2o1+o2)$ (5)

**Q2(a)** Explain Bresenham line drawing algorithm with proper mathematical analysis and identify the pixel positions along a line between A(10,10) and B(18,16) using it.
(10)

**(b)** Explain the steps for 2D rotation about arbitrary point and provide a composite transformation for the same.
(10)

**Q3(a)** Explain Liang Brasky line clipping algorithm. Apply the algorithm to clip the line with coordinate (30,60) and (60,20) against window (xmin,ymin) = (10,10) and (xmax.ymax)=(50,50). (10)

**(b)** Explain Sutherland Hodgman polygon clipping algorithm with suitable example and comment on its shortcomings. (10)

**Q4(a)** What is Windows and viewport? Drive the window to viewport transformation and also identify the geometric transformation involved. (10)

**(b)** Explain what is meant by Bezier curve? State the various properties of Bezier curve. (10)

**Q5(a)** What is meant by parallel and perspective projection? Derive matrix for oblique projection (10)

**(b)** Explain Z Buffer algorithm for hidden surface removal. (10)

**Q6) Write a short notes on (any two)**

**a)** Koch curve (5 marks)

**b)** Sweep representation and Octree representation (5 marks)

**c)** Gourand and phong shading (5 marks)

**d)** Halftonig and Dithering (5 marks)