

B.E. 5th Semester (I.T.) Examination,

December-2013

COMPUTER GRAPHICS

Paper-CSE-303-E

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions. All questions carry equal marks.

1. (a) Draw the block diagram and explain the working of a raster display system. Differentiate between horizontal retrace and vertical retrace.
(b) Write the steps required to plot a line whose slope is between 0° and 45° using Bresenham's method.
2. (a) Derive the transformation that rotates an object point \square° above the origin. Write the matrix representation for this.
(b) Write and explain briefly the Sutherland Hodgeman polygon clipping algorithm.
3. (a) Show what happens when an object "behind" the centre of projection is projected by $M_{\text{perspective}}$ and then clipped why in general one can't project and then clip?

- (b) What do you mean by Co-ordinate system ?
Explain normalization device co-ordinate system and logical co-ordinate system.
4. Why we require hidden surface removal algorithms ?
Write and explain the scan-line method for hidden surface removal. How the amount of computation can be reduced in this method ?
5. (a) Where has the term "spline" originated from ?
Differentiate between rational B-Spline and non uniform B-Spline with suitable examples.
- (b) Compare B-spline curve and Bezier curve.
6. Differentiate between diffuse and specular reflection.
Also explain Phong illumination model.
7. (a) What is an image ? How quality of an image can be improved with filtering ?
- (b) Write and explain the flood fill algorithms.
8. (a) Derive transformation matrix to scale a unit cube twice uniformly w.r.t origin. Find the coordinates of transformed cube.
- (b) Explain Z-buffer algorithm.