TCS-501 1205

Odd Semester Examination 2018-19

B.TECH. (CSE) (SEMESTER-V)

COMPUTER GRAPHICS

Time: 03:00 Hours **Max Marks : 100**

Section A

Note: Attempt **any four**. All question carry equal marks: [4×5=20]

1. Define the following terms:
   (a) Convex hull
   (b) HIS Model
   (c) Polygon Meshes
   (d) Cohen-Sutherland Line Clipping
   (e) Illumination Model

Section B

Note: Attempt **any four**. All question carry equal marks: [4×5=20]

1. Differentiate between Bezier and B-spline curve.
2. Construct a line using DDA algorithm in which initial point is (0,0) and final point is (6,7).
3. What do you mean by reflection and shearing , explain with diagram and matrix form.
4. Differentiate between beam-penetration and shadow mask method using suitable diagram.
5. What steps are required to scan convert a circle using Bresenham's algorithm.

Section C

Note: Attempt **any four**. All question carry equal marks: [4×5=20]

1. State and explain the weileratherton polygon clipping algorithm with proper diagram.
2. Translate the pyramid defined by the co-ordinates A(0,0,0) B(1,0,0) C(0,1,0) D(0,0,1),2units each in x,y,z directions.
3. use the cohen-sutherland algorithm to find the visible portion of the line P(40,80) and Q(120,30) inside the window ,the window is defined as ABCD : A(20,20), B(60,20) ,C(60,40), D(20,40).
4. Differentiate between raster scan and random scan systems.
5. What steps are required to generate a circle using the polynomial method

Section D

Note: Attempt **any two**. All question carry equal marks: [2×10=20]

1. Obtain the mirror reflection of a triangle formed by vertices A(0,3) B(2,0) and C(3,2) about line passing through the points (1,3) and (-1,-1).
2. Give a single 3*3 homogenous coordinate transformation matrix, which will have same effect as each of the following transformation sequences. [10]
   (a) Scale the image to be twice as large & then transmit it 1 unit to left.
   (b) Scale the X direction to be one-half as large & then rotate counter clockwise by 90 degree about the origin.
   (c) Rotate counter clockwise about the origin by 90 degree and then scale the X direction to be one –half as large
   (d) Translate down one-half unit, right one-half unit & then rotate counter clockwise by 45 degree.

3. State Sutherland-hodgeman polygon clipping algorithm and also mention its advantages and state the differences between concave & convex polygon.

Section E

Note: Attempt **any two**. All question carry equal marks: [2×10=20]

1. Consider following window coordinates A(100,10) B(160,10) C(160,40) and D(100,40). Find visible portion of line segments EF, GH and IJ using cohen Sutherland algorithm. The points are E(50,0), F(70,80), G(120,20), H(140,80), I (120,5) and J (180,30).

2. Draw line with the help of Bresenham's algorithm for following given points P1(20,10) & P2(28,22).

3. Write down the differences between beam-penetration and shadow mask method explain it with the help of suitable diagram And how much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 640*480 and a refresh rate of 60 frames per second.

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