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13MCA34

Third Semester MCA Degree Examination, Dec.2014/Jan.2015
Computer Graphics

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Differentiate between open GL core library open GL utility and open GL utility kit. **(06 Marks)**

b. List the statement needed to setup an open GL display window whose lower-left corner is at pixel position (100,100) and with a window aspect ratio 300×300. **(04 Marks)**

c. Explain the open GL display call back routine with an example. **(03 Marks)**

d. Explain open GL point functions and line functions briefly with examples. **(07 Marks)**

2 a. Write a program to create a chess board using DDA line drawing algorithm. **(07 Marks)**

b. Write mid point circle drawing algorithm which exhibits 8-way symmetry. **(07 Marks)**

c. Explain boundary-fill algorithm in brief. **(06 Marks)**

3 a. Explain two dimensional translation, scaling, rotation, reflection transformations. **(09 Marks)**

b. What is composite transformation? Show that the composition of two rotations is additive and two scaling is multiplicative by concatenating the matrix representations for $R(\theta_1)$, $R(\theta_2)$ and (S_{x_1}, S_{y_1}) (S_{x_2}, S_{y_2}). **(06 Marks)**

c. Explain about general pivot point rotation. **(05 Marks)**

4 a. Explain 3-dimensional rotation transformation. **(03 Marks)**

b. Explain 3-dimensional reflections and shearing transformations. **(06 Marks)**

c. Explain Affine transformations. **(03 Marks)**

d. Write a program to create (without using built-in function) a triangle by implementing scaling algorithm by zooming / un-zooming i) x-axis ii) y-axis iii) xy-plane. **(08 Marks)**

5 a. What do you mean by view port? Explain 2-D viewing transformation pipe line. **(05 Marks)**

b. Explain cohen-sutherland line clipping algorithm. **(08 Marks)**

c. Explain Liang-Barsky line clipping algorithm. **(07 Marks)**

6 a. Define projection, depth cueing and surface rendering in 3-dimensional viewing. **(06 Marks)**

b. What are the three-dimensional viewing co-ordinate parameters? Explain in brief. **(06 Marks)**

c. Explain the 3-dimensional transformation matrices from world to viewing co-ordinates. **(08 Marks)**

7 a. Explain the following:
i) Orthogonal projection
ii) Oblique parallel projections. **(10 Marks)**

b. Explain perspective projections. **(05 Marks)**

c. Explain 3-dimensional screen co-ordinates. **(05 Marks)**

8 a. What is Bezier spline curve? Derive an equation for Bezier curve. **(08 Marks)**

b. What is computer animation? Explain the basic approach to design a animation sequence. **(06 Marks)**

c. Write short notes on:
i) Traditional animation technique.
ii) General computer-animation functions. **(06 Marks)**

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