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13MCA34

Third Semester MCA Degree Examination, Dec.2015/Jan.2016
Computer Graphics

Time: 3 hrs. Max. Marks:100

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

1 a. What is OpenGL? Explain OpenGL point and Line functions. **(05 Marks)**
b. Briefly explain absolute and relative coordinate specifications. **(05 Marks)**
c. Explain digital differential analyzer (DDA) line drawing algorithm. **(10 Marks)**

2 a. Write a program to implement Bresenham's line drawing algorithm with all values of slopes. **(10 Marks)**
b. Explain the boundary fill algorithm in detail. **(10 Marks)**

3 a. What is homogeneous co-ordinate system? Using this co-ordinate system, represent all the basic 2D transformations. **(10 Marks)**
b. What is concatenation of transformations? Explain rotation about a fixed point. **(06 Marks)**
c. Explain shear and reflection with respect to 2 – dimensions. **(04 Marks)**

4 a. Explain translation, rotation and scaling with respect to 3 – dimensions. **(10 Marks)**
b. What are quaternions? With illustrative example, explain how quaternions are used in rotations in a 3D space. Give the mathematical representation of quaternions. **(10 Marks)**

5 a. Write a complete program to implement the Liang-Barsky line-clipping algorithm. **(10 Marks)**
b. What is polygon clipping? Explain Sutherland – Hodgeman polygon clipping algorithm. **(10 Marks)**

6 a. Explain Three – Dimensional viewing pipeline. **(10 Marks)**
b. Explain Three – Dimensional viewing – co ordinate parameters. **(10 Marks)**

7 a. Derive the projection matrices for parallel viewing? **(10 Marks)**
b. Derive the projection matrices for perspective viewing? **(10 Marks)**

8 Write a short notes on :
a. Bezierspline curves
b. Double Buffering
c. Design of Animation sequences
d. Traditional Animation Techniques. **(20 Marks)**

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