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Question Paper Code : 51397

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Seventh Semester

Computer Science and Engineering

CS 2401/CS 71/10144 CS 702 – COMPUTER GRAPHICS

(Common to Information Technology)

(Regulations 2008/2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Reflect the given triangle about x-axis whose coordinates are A(4, 1) B(5, 2) C(4, 3) and find out the new coordinates.
2. Define resolution.
3. Write down the significance of vanishing point.
4. A unit cube is located at the origin. Find the oblique view (Parallel projection) on XY plane with light ray falling along the line (1, 0, 0) and (9, 0, 6).
5. How are intermediate frames generated in animation ?
6. When do you use init function in Opengl ?
7. Differentiate specular reflection and Diffuse reflection.
8. How will you create a frame buffer using Opengl ?
9. Calculate the fractal dimension of a Sierpinski triangle.
10. Write any two applications where constructive solid geometry is applied.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Scan convert a straight line whose end points are (5, 10) and (15, 35) using Bresenham's line drawing algorithm for an aspect ratio of 1 : 1. (8)
- (ii) Apply Sutherland Hodgman algorithm to the pentagon whose vertices are A(16, 7) B(24, 7) C(36, 10) D(27, 19) E(6, 12). The window edges are $x = 10$ and 30 and $y = 5$ and 15 . (8)

OR

- (b) (i) The matrix $\begin{Bmatrix} 1 & a \\ 0 & 1 \end{Bmatrix}$ defines a shearing transformation. When $b=0$ the shearing is in the x direction and when $a=0$ the shearing is in the y direction. Demonstrate the effect of these shearing transformations on the square A(0, 0) B(2, 0) C(2, 2) and D(0, 2) when $a=3$ and $b=4$. (8)
- (ii) Scan convert an ellipse with major and minor axes as 5 and 3 units and centered at origin. (8)

12. (a) (i) List the properties of Bezier curves. (8)
- (ii) Determine the coordinates of the rectangular block with x , y and z dimensions of 4, 6 and 8 units with the block entirely in the first quadrant transformed about a focus (2, -1, 3). (8)

OR

- (b) (i) Discuss on information visualization techniques in detail. (8)
- (ii) For an unit cube whose (0, 0, 0) is centered at origin, eliminate the hidden lines using Back face detection method. (8)

13. (a) (i) Compare and contrast RGB and YIQ color models in detail. (8)
- (ii) Write down the code snippet to set the camera in OpenGL for parallel projection of scenes. (8)

OR

- (b) (i) Discuss on the various animation techniques in detail. (8)
- (ii) With code snippets explain the process of reading a scene description from a file using SDL. (8)

14. (a) Explain the process of adding textures to faces in detail. (16)

OR

(b) Explain the techniques of Bump mapping and non photo realistic rendering in detail. (16)

15. (a) (i) Explain the process of ray tracing a scene using pseudo code skeleton of a ray tracer. (8)

(ii) How will you build a projection extent for each node of a CSG object? (8)

OR

(b) Write short notes on :

(i) Ray tracing Vs Ray casting (6)

(ii) Intersecting rays with cube (5)

(iii) Shadow addition (5)