6E6024

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B.Tech. VI Semester (Main/Back) Examination, April/May - 2017
Computer Sc. & Engg.
6CS4A Computer Graphics and Multimedia Techniques

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit-I

1. a) Explain various application areas of computer graphics. Differentiate beam penetration method of colored CRT with shadow mask method. **(4+4=8)**

   b) What steps are required to plot a line whose slope in between 0° and 45° using Bresenham's method? Indicate the raster locations would be chosen by Bresenham's algorithm when scan converting a line from screen coordinate (20,10) to (30,18). **(4+4=8)**

(OR)

1. a) If a TV screen has 525 scan lines and an aspect ratio of 3:4 and if each pixel contains 12 bits of intensity information, how many bits are required for refresh rate 30 frames per second? **(8)**

   b) Give the advantages and disadvantages of DDA line algorithm. Explain mid point circle algorithm. **(2+6=8)**

Unit-II

2. a) Show rotation of a 2D Box represented by (5,5) to (10,15) with respect to (5,5) by 90° in anticlockwise direction. **(8)**

   b) Explain flood fill algorithm. Differentiate it with Boundary fill algorithm. **(5+3=8)**

(OR)

2. a) Explain Cohen Sutherland line algorithm. **(8)**

b) Show that the composition of two rotations is additive by concatenating the matrix representation for $R(\theta_1)$, and $R(\theta_2)$ to obtain : **(8)**

$R(\theta_1).\ R(\theta_2) = R(\theta_1+\theta_2)$

Unit-III

3. a) Explain the scan line method for displaying the visible surface of a given polyhedron. **(8)**

b) Differentiate B-splines with Bezier curves. Briefly describe B-spline curve. **(3+5=8)**

(OR)

3. a) What is hidden surface problem? Write and explain Z-buffer algorithm for visible surface detection. **(2+6=8)**

b) What is parametric representation of a curve? Explain Bezier curve in detail. **(2+6=8)**

Unit-IV

4. a) Explain following terms : **(3×3=9)**

i) Diffuse reflection

ii) Specular reflection

iii) Illumination model

b) Explain phong shading. Compare it with Gouraud shading. **(4+3=7)**

(OR)

4. a) What is Ray Tracing? Explain Basic ray tracing algorithm. **(2+6=8)**

b) Explain color model RGB. Compare it with HSV. **(5+3=8)**

Unit-V

5. a) Define Animation. Explain principles of animation briefly. **(2+6=8)**

b) What is compression of data? Explain MPEG in detail. **(2+6=8)**

(OR)

5. a) Explain various presentation tools. **(8)**

b) Explain Authority tools with their uses. **(8)**