CBCS SCHEME

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15CS62

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Computer Graphics & Visualization

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define computer graphics. Explain the application of computer graphics. **(08 Marks)**

b. Explain co-ordinate representation with a neat diagram. **(05 Marks)**

c. Explain openGL point functions. **(03 Marks)**

OR

2 a. Explain Bresenhams line drawing algorithm and illustrate the same with end points (20, 10) and (30, 18) **(08 Marks)**

b. Draw a circle with radius r = 10 using midpoint circle algorithm. **(02 Marks)**

c. Explain architecture of simple raster system and architecture of raster system with a display processor. **(06 Marks)**

Module-2

3 a. Explain Inside and Outside test with relevant diagrams/examples. **(04 Marks)**

b. Explain general scanline polygon fill algorithm. **(08 Marks)**

c. Define convex and concave polygon and illustrate vector method for splitting concave polygon for Fig. Q3 (c) by considering the following Edge data $E_1 = (1, 0, 0)$, $E_2 = (1, 1, 0)$, $E_3 = (1, -1, 0)$, $E_4 = (0, 2, 0)$, $E_5 = (-3, 0, 0)$, $E_6 = (0, -2, 0)$

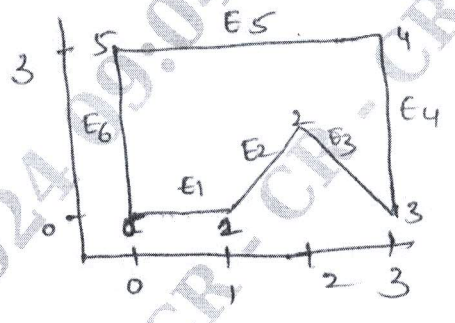

Fig. Q3 (c) **(04 Marks)**

OR

4 a. Explain the following :

(i) General 2D pivot point rotation.

(ii) General 2D fixed point scaling. **(08 Marks)**

b. Write an openGL program that demonstrates 2D viewing functions. **(08 Marks)**

Module-3

5 a. Explain Sutherland-Hodgman polygon clipping with an example. **(08 Marks)**

b. Derive composite matrix that map the clipping window into a Normalized viewport. **(08 Marks)**

OR

6 a. Explain 3D translation, 3D Rotation, 3D scaling with suitable diagrams and write program (code) for translation and scaling. **(10 Marks)**

b. Explain CMYK and RGB color models. **(06 Marks)**

Module-4

7 a. Explain the following :
(i) Depth cueing.
(ii) 3D viewing pipeline **(08 Marks)**

b. Explain orthogonal projections. **(08 Marks)**

OR

8 a. Explain in detail depth buffer algorithm. **(08 Marks)**

b. Explain openGL visibility detection function. **(08 Marks)**

Module-5

9 a. Explain how Menu and Submenus are created using GLUT with an example. **(06 Marks)**

b. Explain the different modes to obtain measures with example. **(06 Marks)**

c. What is display list? Explain the usage of display list with an example. **(04 Marks)**

OR

10 a. Write an openGL program to display three quadric surface objects sphere, cone, cylinder in wire frame representation using GLUT and GLU Quadric surface functions. **(08 Marks)**

b. Explain Bezier Spline curves. **(08 Marks)**

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