

# CBCS SCHEME

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15CS62

## Sixth Semester B.E. Degree Examination, Feb./Mar. 2022 Computer Graphics and Visualization

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. What is computer graphics? Briefly explain the applications of computer graphics. (06 Marks)
- b. With the help of code snippets, explain the OpenGL point function and OpenGL line function. (04 Marks)
- c. What is DDA? What are the disadvantages of DDA algorithm? (06 Marks)

OR

- 2 a. Explain the working principle of Raster Scan Systems. (08 Marks)
- b. Digitize a Line from (20, 10) to (30, 18) on a raster screen using Bresenham's straight line algorithm. (08 Marks)

### Module-2

- 3 a. How to identify the concave polygons? Give the different methods for splitting a concave polygon. Explain with an example. (10 Marks)
- b. Develop a OpenGL program to rotate a triangle about  $45^\circ$  having a vertices A(10, 10), B(60, 10) and C(35, 35) about a fixed point using OpenGL functions. (06 Marks)

OR

- 4 a. Discuss on basic two-dimensional geometric transformation. (12 Marks)
- b. Define Reflection. Give the matrices for Reflections. (04 Marks)

### Module-3

- 5 a. Explain Cohen-Sutherland Line clipping algorithm with an example. (06 Marks)
- b. Write an OpenGL program to draw a color cube and spin it using OpenGL functions. (10 Marks)

OR

- 6 a. Briefly explain the different types of Light Sources. (06 Marks)
- b. What is RGB Color Model? How it is represented? (04 Marks)
- c. What are basic illumination models? Briefly, explain Phong illumination model. (06 Marks)

### Module-4

- 7 a. Explain how clipping window and orthogonal projection view volume are determined. Give normalization transformation matrix for an orthogonal projection. (10 Marks)
- b. Explain in detail about depth-buffer algorithm for visible surface detection. (06 Marks)

OR

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8=50$ , will be treated as malpractice.

- 8 a. Briefly explain the concept of symmetric perspective projection frustum. (10 Marks)  
b. Write the code snippets for Depth-Buffer functions and Depth-Culling function. (06 Marks)

**Module-5**

- 9 a. Discuss the request mode, sample mode and event mode, with the figure wherever required. (10 Marks)  
b. Explain in detail about Bezier Spline Curves. (06 Marks)

**OR**

- 10 a. How pop-up menus are created using GLUT? Illustrate with an example. (10 Marks)  
b. Write a short note on quadric surfaces. (06 Marks)

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