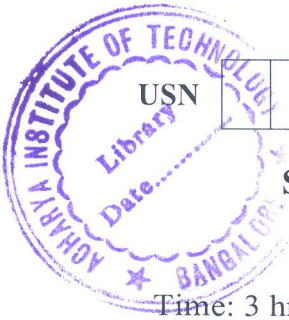


# CBCS SCHEME



15CS62

## Sixth Semester B.E. Degree Examination, July/August 2021 Computer Graphics & Visualization

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Explain the application areas of computer graphics with examples. (09 Marks)  
b. Write a note on Raster Scan Systems. (04 Marks)  
c. Compare Raster Scan displays with Random Scan displays. (03 Marks)
- 2 a. Explain the importance of OpenGL libraries interms of their functions. (03 Marks)  
b. Write the DDA line drawing algorithm steps and mention list advantages and disadvantages. Use Bresenham's line drawing algorithm to draw line between points (20, 10) and (30, 18). (09 Marks)  
c. Write and explain midpoint circle drawing algorithm. (04 Marks)
- 3 a. How will you classify polygons? Explain all possible methods for the classification. (10 Marks)  
b. Explain scanline polygon fill algorithm with the help of an suitable example. (06 Marks)
- 4 a. Explain how it is advantageous to represent the vertices in homogeneous coordinate system? Write the composite 2D transformation matrix for computational efficiency and for rigid body transformation. (Write the 2D transformation matrix only). (06 Marks)  
b. List and explain OpenGL functions for Raster methods of 2D transformations (any 4 functions). (04 Marks)  
c. With a neat diagram, explain 2D viewing transformation pipeline. (06 Marks)
- 5 a. What is clipping? Why it is required? Explain Cohen-Sutherland line-clipping algorithm steps with example. (08 Marks)  
b. Write a note on basic illumination models along with their corresponding OpenGL functions. (08 Marks)
- 6 a. Explain the composite transformation sequence for general 3D rotations of an object about an axis that is parallel to x-axis. Also give the specifications for the rotation axis and rotation angle. (08 Marks)  
b. Explain Sutherland-Hodgman's polygon clipping algorithm with example. (06 Marks)  
c. Write the expression for the transformation between CMY and RGB color space (matrix). (02 Marks)
- 7 a. List and explain different projections supported in computer graphics in detail with example. (10 Marks)  
b. Explain two visible surface detection methods, back-face detection methods and Depth-Buffer method. (06 Marks)
- 8 a. Write a simple program to demonstrate 3D viewing of an object using OpenGL functions. (10 Marks)  
b. Compare parallel projections and perspective projection. (06 Marks)

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.

- 9 a. List and explain the steps involved for design of animation sequence involved in basic design approach. (08 Marks)
- b. Explain OpenGL quadric surfaces and cubic surface function. (06 Marks)
- c. Double buffer is a solution for drawing complex graphics. Justify. (02 Marks)
- 10 a. Explain two major characteristics of an input device to describe its logical behavior. Explain OpenGL functionalities provided for logical inputs. (08 Marks)
- b. Explain the major features of an interactive program. (05 Marks)
- c. Explain different input modes used in computer graphics for providing input interaction. (03 Marks)

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