

10CS65

Sixth Semester B.E. Degree Examination, June/July 2023
Computer Graphics & Visualization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

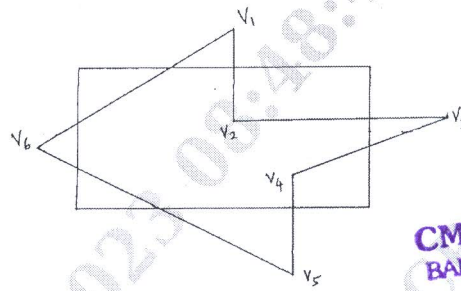
PART – A

- 1 a. Explain the concept of pinhole camera of an imaging system. Also derive the expression for angle of view. (10 Marks)
b. Discuss the graphics pipeline architecture with the help of a functional schematic diagram. (10 Marks)
- 2 a. Write a typical main function that is common to most non-interactive applications and explain each function call in it. (10 Marks)
b. Explain the major categories of graphics API functions. (07 Marks)
c. Explain “Color Cube” in brief. (03 Marks)
- 3 a. What is a measure and trigger of a logical input device? Explain the different modes to obtain the measure, with example. (06 Marks)
b. What is a display list? How it increases the performance of a graphics system? Explain with example. (06 Marks)
c. List out the characteristics of a good interactive program, with example for each. (08 Marks)
- 4 a. Explain the procedure involved in transforming the world frame to camera/eye frame using the model view matrix. (10 Marks)
b. Explain a modeling a colored cube in detail with the OpenGL functions used to create a colored cube. (10 Marks)

PART – B

- 5 a. Explain the basic affine transformations in 3D along with their matrix forms. (08 Marks)
b. How does instance transformation help in generating a scene? Explain. (06 Marks)
c. Explain OpenGL transformation matrices along with their syntax. (06 Marks)
- 6 a. Explain different types of views in graphics system. (06 Marks)
b. How perspective projection differs from orthogonal projection? Give OpenGL functions for the same. (06 Marks)
c. Write a program to display a set of values $\{f_i\}$ as a rectangular mesh. (08 Marks)
- 7 a. Explain the Phong lighting model. (10 Marks)
b. Explain the polygon shading in detail. (10 Marks)
- 8 a. What is clipping? Explain Cohen-Sutherland line-clipping algorithm in 2D. (06 Marks)
b. Clip the following polygon using Sutherland-Hodgeman algorithm shown in Fig. Q8 (b). (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.



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Fig. Q8 (b)

- c. Write short notes on:
i) DDA algorithm.
ii) Z-buffer algorithm.

(08 Marks)

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