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Sixth Semester B.E. Degree Examination, Dec.2014/Jan.2015
Computer Graphics & Visualization

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. With a neat diagram, explain the graphics pipeline architecture. (10 Marks)
b. What are the OpenGL API's for handling polygon types, color attributes, viewing and aspect ratio? (06 Marks)
c. Briefly explain any two applications of computer graphics. (04 Marks)
- 2 a. What are the graphics functions which give good API support? Briefly explain each of them with example. (10 Marks)
b. What are the different approaches of color in open GL? Explain with example. (10 Marks)
- 3 a. List the various features that a good inter active programs should include. Describe an open GL animating inter active program for the rotating square. (10 Marks)
b. Explain how an event driven input can be performed for window and keyboard events. (10 Marks)
- 4 a. Briefly explain the order in which frames occurs in open GL pipeline. (08 Marks)
b. With respect to modeling of color cube discuss:
i) Vertex array.
ii) Bilinear interpolation.
iii) Data structure for object representation. (12 Marks)

PART – B

- 5 a. What are Affine tranformation? Explain the basic transformation with respect to homogenous co-ordinate system in 3D. (10 Marks)
b. What are Quaternion? With an example, explain how Quaternion are used in rotation in a 3D space. Give the mathematical representation of Quaternion. (10 Marks)
- 6 a. What are simple projections? Obtain prespective and orthogonal 4×4 matrix representation. (10 Marks)
b. Briefly explain different types of viewing with neat sketches. (10 Marks)
- 7 a. Explain the Phong lighting model. (10 Marks)
b. Give the different classification of light material interactions. How are these supported in open GL? (10 Marks)
- 8 a. Explain the Cohen Sutherland line clipping algorithm and perform the clipping for line segment $AB = [(-13,5)(17,11)]$, $CD[(-2,3)(1,2)]$ against the window having lower left corner $(-8,-4)$ and upper right corner at $(12,8)$. (10 Marks)
b. Explain the scan line polygon filling algorithm. (10 Marks)

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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.