

--	--	--	--	--	--	--	--	--	--

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 transformation? 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)

* * * * *