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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec. - 2015

Interactive Computer Graphics and Visualization

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.*

UNIT - I

1 a. Distinguish between the following :
   i) Random scan and Raster Scan display
   ii) Stroke text and Raster text
   iii) RGB color model and indexed color model.
   iv) Display processor and pipeline Architecture. 8

   b. Write a typical main function that works for most non-interactive applications and explain each function call in it. 12

2 a. Describe briefly the attribute functions of Open GL. 6

   b. Explain polygon basics and different types of polygons used in Open GL. 8

   c. Write a note on modeling - Rendering paradigm. 6

UNIT - II

3 a. Rotate a triangle A(0, 0), B(2, 2), C(4, 2) about the origin and about p(-2, -2) by and angle of 45º. 10

   b. List the geometric objects and associated operations in affine space. 10

4 a. Explain the transformation matrix functions supported by Open GL. 10

   b. Derive a matrix to perform rotation about an arbitrary axis using concatenation of transformation. 10

UNIT - III

5 a. Find the clipping Co-ordinates for a line P_1, P_2 where P_1 = (10, 10) and P_2 (60, 30) against window with (X_{wmin}, Y_{wmin}) = (15, 15) and (X_{wmax}, Y_{wmax}) = (25, 25) using Liang-Barsky algorithm. 10

   b. Write a note on how menus can be created and used in Open GL. 6

   c. Enlist any four classes of logical input devices that are used in Open GL. 4

6 a. Explain how an event driven input can be performed for window and keyboard events. 10

   b. Use Cohen-Sutherland Outcode algorithm to chip two lines P_1(40, 15), P_2(75, 45) and P_3(70, 20) and P_4(100, 10) against a window A(50, 10), B(80, 10), C(80, 40) and D(50, 40). 10

Contd…2

UNIT - IV

7	a.	How is view volume is specified in Open GL? Explain with examples.	10
	b.	Describe different classical views with a neat diagram.	10
8	a.	Explain and derive the matrices for parallel projection.	8
	b.	Explain the hidden surface removal algorithm.	8
	c.	Define the terms : i) Centre of projection ii) Direction of projections	4

UNIT - V

9	a.	Compare Gourand and Phong's shading.	8
	b.	Discuss the different methods available for shading a polygonal mesh.	12
10	a.	Explain the different properties of Bezier curve.	6
	b.	State the three basic ways of specifying spline curve.	6
	c.	Write a note on cubic B-splines.	8

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