



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

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, Master of Computer Applications (MCA)

Semester End Examination; Dec - 2016/ Jan - 2017

Computer Graphics

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

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|------|---|----|
| 1 a. | Describe DDA line drawing algorithm. Trace the algorithm with the end points (20, 10) and (30, 18). | 10 |
| | b. Write an OpenGL C++ program to draw a line segment using OpenGL output primitives. | 5 |
| | c. Write a note on Error Handling in OpenGL. | 5 |
| 2 a. | Describe the OpenGL polygon Fill-area functions. | 10 |
| | b. Write an algorithm to draw an ellipse using midpoint ellipse drawing algorithm. | 10 |

UNIT - II

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|------|---|----|
| 3 a. | Explain the following : | |
| | i) Two-Dimensional Reflection ii) Two-Dimensional shear. | 10 |
| | b. Find new vertices to rotate triangle about the origin with vertices at original coordinates (10, 20), (10, 10), (20, 10) by 30 degree. | 10 |
| 4 a. | Describe the Three-dimensional geometric transformations. | 10 |
| | b. Illustrate the steps to obtain the transformation matrix when an object is to be rotated about an axis that is parallel to one of the coordinate axis. | 5 |
| | c. List and explain OpenGL geometric transformation functions used in 3D transformation. | 5 |

UNIT - III

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|------|--|----|
| 5 a. | Write a short note on : | |
| | i) Two-Dimensional viewing pipeline ii) Clipping window. | 10 |
| | b. Explain Liang-Barsky line clipping algorithm. | 10 |
| 6 a. | Describe the steps involved in mapping the clipping window into a normalized square. | 10 |
| | b. Explain Weiler-Atherton polygon clipping algorithm. | 10 |

UNIT - IV

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|------|--|----|
| 7 a. | Describe Three-Dimensional viewing coordinate parameters. | 10 |
| | b. Distinguish between parallel and perspective projection. | 10 |
| 8 a. | Illustrate the steps to obtain perspective projection transformation coordinates. | 10 |
| | b. Derive an expression for the normalized perspective-projection transformation matrix. | 10 |

UNIT - V

- 9 a. Derive cubic Bezier Matrix. 10
- b. What is computer animation? Explain basic approaches to design of animation sequences. 10
- 10 a. Explain the traditional animation techniques and list the general animation functions involved in managing the objects. 10
- b. Explain the Bezier curves techniques. List the properties of Bezier curves. 10

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