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**Question Paper Code : 60397**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Computer Science and Engineering

CS 2401 / CS 71/10144 CS 702 – COMPUTER GRAPHICS

(Common to Information Technology)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define aspect ratio.
2. How will you clip a point?
3. What are the categories of visible surface detection algorithms? Give example.
4. How will you represent a curve in graphics?
5. List any four real-time animation techniques.
6. How are mouse data sent to an OpenGL application?
7. What is a shadow?
8. Define texture.
9. What is a 'Koch Curve'?
10. What is CSG technique?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Calculate the pixel location approximating the first octant of a circle having centre at (4, 5) and radius 4 units using Bresenham's algorithm. (8)
- (ii) Discuss in brief: Antialiasing techniques (8)

Or

(b) (i) A polygon has four vertices located at A(20, 10) B(60, 10) C(60, 30) D(20, 30). Calculate the vertices after applying a transformation matrix to double the size of polygon with point A located on the same place. (8)

(ii) The reflection along the line  $y = x$  is equivalent to the reflection along the X axis followed by counter clockwise rotation by  $\phi$  degrees. Find the value of  $\phi$ . (8)

12. (a) (i) Determine the blending function for Uniform periodic Bspline curve for  $n=4$ ,  $d=4$ . (8)

(ii) Explain any one visible surface identification algorithm. (8)

Or

(b) Explain a method to rotate an object about an axis that is not parallel to the coordinate axis with neat block diagram and derive the transformation matrix for the same. (16)

13. (a) (i) Explain RGB color model in detail. (8)

(ii) Explain how 3D scenes are drawn. (8)

Or

(b) (i) Discuss the computer animation techniques. (10)

(ii) Explain how 3D objects are drawn (6)

14. (a) (i) Explain the process of mapping texture over a cylindrical surface. (8)

(ii) Explain the vector interpolation technique used by Phong shading model. (8)

Or

(b) (i) How does environment mapping differ from surface texturing process? What is the effect of any directional light source? (8)

(ii) Explain the process of drawing shadows for modeled objects. (8)

15. (a) (i) How are Peano curves produced? Give examples. (8)

(ii) Write short notes on Mandelbrot sets. (8)

Or

(b) Describe the process of Ray Tracing. Explain how it is used to create Reflections and Transparency. (16)