

Time: 3 Hours

JUNE 2015

Max. Marks: 100

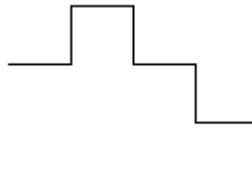
PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE:

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
- Parts of a question should be answered at the same place.

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- Q.1**
- Explain the color generation technique for cathode ray display device.
 - Give the location of first four pixels of the line joining (0,0) and (5,6), use DDA algorithm.
 - Derive the transformation matrix for reflection of a point along the line inclined at an angle of -45 degrees with positive direction of X-axis.
 - Explain the coding scheme of Cohen Sutherland line clipping algorithm.
 - Define parametric and geometric continuity. Differentiate between them with the help of an example.
 - Depict diagrammatically one, two and three vanishing points.
 - What are the naming conventions in OpenGL for command name, constant and function. (7×4)
- Q.2**
- Explain the use of computer graphics in engineering and architectural system. (10)
 - Write Bresenham's circle drawing algorithm in an octant. The centre of the circle is at origin and radius is r. (8)
- Q.3**
- Establish the transformation matrix for scaling of an object in 2D with respect to a fixed point (x_f, y_f) . (6)
 - Give a method to identify a concave polygon giving an example. How can a concave polygon be split into convex polygons? (6)
 - Explain scan line polygon fill algorithm. (6)

- Q.4** a. What is the boundary condition for the Hermite curve? Give the derivation of the blending functions for the Hermite curve. (8)
- b. Derive the condition for the parametric continuity of first order at the point of intersection of two cubic Bezier curve sections. (4)
- c. Write two advantages of B-splines over Bezier curve. (3)
- d. Define uniform periodic B-spline, give an example. (3)
- Q.5** a. What are the various types of parallel projections? Explain each briefly. (6)
- b. Identify the various sweep techniques for generating 3D solids. (6)
- c. Explain forward difference method for displaying curves. (6)
- Q.6** a. Giving the computation of depth value, explain the depth buffer algorithm for detecting visible surfaces. What is its drawback? How is it removed? (10)
- b. What is specular reflection? Explain the Phong's specular reflection model in detail. (8)
- Q.7** a. What is fractal dimension? How is it determined? Calculate the dimension of fractal with generator. (6)



- and one segment length = $1/3$. (6)
- b. Explain the morphing used in animation. (6)
- c. Write a short note on OpenGL. (6)