

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

**III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
COMPUTER GRAPHICS
(MECHATRONICS)**

NOVEMBER/DECEMBER 2005

TIME - 3 HOUR
MARK - 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) What is the difference between simple DDA and Bresenham's line generation algorithm?
(b) Explain how dotted lines can be drawn.
(c) What is the method of producing a thick line segment? [5+5+6]
2. (a) Explain the role of display interpreter in graphical display, with a block diagram.
(b) What is meant by normalized device co-ordinate system? What are its advantage? [6+10]
3. (a) Derive the transformation matrix that rotates an object point ' θ ' degrees about the origin. Represent the output in the matrix form.
(b) Find the new co-ordinates of the point $p(2, -4)$, after rotating 30 degrees anti-clock-wise, about the origin. [8+8]
4. Find the normalization transformation that maps a window whose lower left corner is at (1,1) and upper right corner is at (3,5) onto
(a) a view port that is the entire normalized device screen and
(b) a view port that has the lower left corner at (0,0) and upper right corner at (1/2,1/2). [8+8]
5. Explain the logic of the Sutherland-Hodgman algorithm with the help of a neat flowchart. Illustrate the working of your flowchart with the help of a suitable example. [16]
6. Derive transformation matrix for rotation about an arbitrary axis [16]
7. Write about the following:
(a) 3D clipping
(b) Shading algorithms [8+8]
8. Describe Bezier surface generation technique with examples. [16]