Paper -V(MCA-404) : Computer Graphics

UNIT- I

Geometry and Line generation: Lines, Line segments and perpendicular lines, distance between a point and a line, vectors, pixels, frame buffers, vector generation, Bresenham's algorithm, anti-aliasing of line, thick line segments, character generation, display the frame buffer.

Graphics Primitives: Display devices, primitive operations, Display file interpreter, Normalized device co-ordinates, Display file structure and display file algorithms, Display control, text, Line style primitives.

UNIT- II

Polygons: Polygon representation, Entering polygons, Polygon interfacing algorithms, filling polygons, filling with a pattern, Initialization, Antialiasing.

Segments: Creation of segment, Closing, deletion and renaming segments, visibility, image transformations, saving and showing segments.

UNIT- III

2D and 3D Transformations: Matrices, Scaling transformations, Rotation, Homogeneous co-ordinates and Translations, Co-ordinate transformations, Rotation about an arbitrary point, Inverse transformations, Transformation routines, Transformation and patterns, Initialization, Display procedures. 3D geometry, 3D primitives and transformations.

UNIT- IV

Windowing and Clipping: The viewing transformation and its implementation, Clipping, Cohen Sutherland Outcode algorithm, Clipping of polygons, generalized clipping, Multiple windowing, Parallel projection, Viewing projections and special projections, Conversion to view plane co-ordinates, Clipping in three dimensions, Clipping planes.

UNIT- V

Hidden surfaces and Lines: Back-face algorithm, Z-buffers, Scan line algorithm, Franklin algorithm, Illumination, Transparency, Reflection, Shadows, Ray tracing, halftones, Color Models

Text/Recommended Books:

Steven Harrington:- Computer Graphics: A programming Approach