

**M.C.A. SEM – IV**

MCA-41 : Computer Graphics & Multimedia

Teaching Scheme (per week)		EXAMINATION SCHEME					
		INT		EXT		TOTAL	
Th. (hours)	Pr. (hours)	Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)
4	3	30	20	70	30	100	50

**UNIT I (25%)**

**An Introduction Graphics System:** Application of computer graphics, **Graphics Systems:** Video Display Devices, Raster Scan Systems, Random Scan Systems, Graphics Monitors and Work Stations, Input Devices, Hard Copy Devices, Graphics Software

**UNIT II (25%)**

**Output Primitives and Attributes of Output Primitives: Output Primitives** Points and Lines, Line Drawing Algorithms, Circle Generating Algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Cell Array, Character Generation **Attributes of Output Primitives:** Line attributes ,Color and Grayscale Levels, Area fill Attributes, Character Attributes, Bundled Attributes.Antialiasing

**UNIT III (25%)**

**Two/Three Dimensional Geometric Transformation and Projection (25%)**

**Two-dimensional Geometric Transformations:** Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Reflection and Shearing

**Two-Dimension Viewing:** The viewing Pipeline, Window to view port coordinate transformation, Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping, Text Clipping, Exterior Clipping

**Three-Dimensional Concepts:** Three Dimensional Display Methods, 3D Transformations, Parallel Projection and Perspective Projection

**UNIT IV (25%)**

**Multimedia and Case Study: Introduction to Multimedia:** Classification of Multimedia, Classification of Multimedia Software, Components of Multimedia – Audio: Analog to Digital conversion, Sound card fundamentals, Audio play backing and recording Video, Text: Hyper text, Hyper media and Hyper Graphics, Graphics and Animation: Classification of Animation **Case Study:** A graphics software **MatLab**, Use of MatLab in graphics application, Features of MatLab, Generalize application by using MatLab

**Reference Books:**

- 1. Computer Graphics By Donald Hearn and M.Pauline Baker PHI Publications**
- 2. Multimedia Magic By S Gokul BPB Publication**

**Question Paper Scheme:**

Section – I		Section – II	
Q.1 - Objective Type Unit I & II	(11) Marks	Q.4 - Objective Type Unit III & IV	(11) Marks
Q.2 - Unit-I <b>OR</b> Q.2 Unit-I	(12) Marks	Q.5 - Unit-III <b>OR</b> Q.5 Unit-III	(12) Marks
Q.3 - Unit-II <b>OR</b> Q.3 Unit-II	(12) Marks	Q.6 - Unit-IV <b>OR</b> Q.6 Unit-IV	(12) Marks

**PRACTICLE LIST**

**Instructions:**

- **Implement all programs in 'c'**
- **Program should have proper variable declaration and function name.**
- **Use comments in code whenever required.**

1. Write a graphics program to draw line using DDA line Algorithm.
2. Write a graphics program to draw line using BRESENHAM LINE Algorithm
3. Write a graphics program to draw circle using Mid Point CIRCLE Algorithm
4. Write a graphics program to draw line lines of different Attributes using DDA line Algorithm.
5. Write a graphics program to draw Rubber Band line using Mouse.
6. Write a graphics program to generate Character Using Bitmap method.
7. Write a graphics program to draw polygon by creating user defined function.
8. Write a graphics program to fill polygon using scan line fill Algorithm.
9. Write a graphics program to fill polygon using flood fill Algorithm.
10. Write a graphics program to fill polygon using boundary fill Algorithm.
11. Write a graphics program to draw different shapes like line, rectangle, circle, ellipse, arc, and polygon.
12. Write a graphics program to translate a polygon in which values of polygon edges and translation points will be given by user.
13. Write a graphics program to rotate a polygon in which values of polygon edges and rotation angle will be given by user.
14. Write a graphics program to scale a polygon in which values of polygon edges and translation points will be given by user.
15. Write a graphics program to rotate a polygon by using pivot-point in which values of polygon edges, pivot-point and rotation angle will be given by user.
16. Write a graphics program to scale a polygon by using fixed-point in which Values of polygon edges and translation points will be given by user.
17. Write a menu-driven graphics program which combine translation, pivot-point rotation, and fixed-point scaling.
18. Write a graphics program for composite transformation which includes translation, rotation and scaling.
19. Write a graphics program which reflects a polygon on different directions.
20. Write a graphics program which shears a polygon relative to different reference lines.
21. Write a graphics program which translates a point from window-to-view port coordinate transformation.
22. Write a graphics program for Point clipping algorithm.
23. Write a graphics program for Parametric Line clipping algorithm.
24. Write a graphics program for Cohen-Sutherland Line clipping algorithm.
25. Write a graphics program for Liang-Barsky Line Clipping algorithm.
26. Write a graphics program for clipping "convex" polygon using Sutherland-Hodgeman Polygon clipping algorithm.
  1. X-----X-----X