

**MASTER OF COMPUTER
APPLICATIONS (MCA) (REVISED)**

Term-End Examination

December, 2024

**MCS-053 : COMPUTER GRAPHICS AND
MULTIMEDIA**

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **three** questions from the rest.*

1. (a) Differentiate between the following :

5×3=15

(i) Parallel Projection and Perspective
Projection

(ii) Lossless and Lossy Compression
Technique

(iii) Bitmap Graphics and Vector Graphics

- (b) Write and explain Z-buffer algorithm for removal of hidden surfaces. What is the maximum number of objects that can be handled by Z-buffer algorithm ? 10
 - (c) Differentiate between Ray Casting and Ray Tracing. 5
 - (d) Briefly discuss scan line polygon fill algorithm with the help of a suitable diagram. 5
 - (e) Briefly discuss the limitations of DDA line generation algorithm, with suitable diagram. 5
2. (a) Write down Bresenham line generation algorithm. Draw a line segment joining (20, 10) and (25, 14) using Bresenham line algorithm. 10
- (b) Explain Cohen-Sutherland line clipping algorithm with suitable example. What are its limitations ? 10
3. (a) Write 2D transformation matrix for homogeneous coordinate system for the following operations : 5
- (i) Translation
 - (ii) Rotation
 - (iii) Scaling
 - (iv) Reflection
 - (v) Shear

- (b) Explain window to viewport transformation with a diagram and equation. 5
- (c) What is the need of shading ? Discuss different types of shading techniques. 10
- 4. (a) Describe Bezier curve. Write the properties of Bezier curves. Given $p_0(1, 1)$; $p_1(2, 3)$; $p_2(4, 3)$ and $p_3(3, 1)$ as the vertices of Bezier curve, determine 3 points on this Bezier curve. 10
- (b) Explain authority tools and its types. 5
- (c) How is acceleration simulated in animation ? Explain. 5
- 5. Explain any *four* of the following : 4×5=20
 - (a) Vanishing Point
 - (b) Area Subdivision Algorithm
 - (c) Hypertext
 - (d) Polygon Representation Methods
 - (e) Illumination Models

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