

MCA (Revised)
Term-End Examination
February, 2021

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

Time : 3 hours

Maximum Marks : 100

Note : *Question number 1 is **compulsory**. Attempt any **three** questions from the rest.*

1. (a) What is a frame buffer ? Discuss the role of frame buffer in the operation of Raster Scan display device. 5
- (b) What are the limitations of Cohen-Sutherland line clipping algorithm ? How did Cyrus-Beck line clipping algorithm overtake the limitations of Cohen-Sutherland algorithm ? 5

- (c) What are the limitations of DDA line generation algorithm ? How did Bresenham's line generation algorithm overtake the limitations of DDA line generation algorithm ? Explain with the help of a suitable diagram. 5
- (d) Compare and contrast 2D Euclidean coordinate system with 2D Homogeneous coordinate system, with the help of an example. 5
- (e) How does perspective projection differ from parallel projection ? Give suitable diagram and mathematical expression in support of your discussion. 5
- (f) What is a Bezier curve ? Write mathematical expression for Bezier curve and explain each component in the expression, with the help of a suitable diagram. 5
- (g) Discuss the role of Intensity Interpolation and Normal Interpolation techniques in Shading. Which of these techniques contributes to Phong Shading ? 5
- (h) What is Lossy Compression technique ? How is it different from Lossless Compression technique ? 5

2. (a) Write 3-D rotational transformation matrix, in homogeneous coordinate system, when rotation is applied to X, Y and Z axes respectively. Perform 45° rotation of a ΔABC ; A(0, 2), B(-1, -1), C(1, -1) about the origin. 10
- (b) Explain the Area Subdivision method of visible surface detection with a suitable diagram. 5
- (b) What is ray tracing ? How does it differ from ray casting ? Explain both with the help of respective diagrams. 5
3. (a) Discuss the role of image editing tools in creating and editing multimedia elements. Briefly describe the criteria behind the selection of an image editing tool. 10
- (b) What is the problem of aliasing ? How do the techniques of anti-aliasing work to get rid of the problem of aliasing ? 5
- (b) Explain the term "Sweep representation". How can a cylinder be produced by using the concept of sweep representation ? 5

4. (a) Differentiate between the following : 10
- (i) Graphics and Animation
 - (ii) Printer and Plotter
 - (iii) Painting and Drawing
 - (iv) Gourand and Phong Shading
 - (v) Caligraphic and Raster Scan Display Devices
- (b) Explain scanline polygon fill algorithm. Draw a suitable diagram to discuss all the cases involved in the explanation of scanline polygon fill algorithm. How does scanline polygon fill algorithm differ from flood fill algorithm ? 10
5. Write short notes on the following : 5×4=20
- (a) Morphing
 - (b) Panning
 - (c) Cel Animation
 - (d) Video File Formats
 - (e) Specular Reflection
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