USN ☐☐☐☐☐☐☐☐☐☐   **13MCA34**

Third Semester MCA Degree Examination, June/July 2018
Computer Graphics

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a. Discuss the methods used in openGL for handling window and also write a simple program to display a window on screen.   **(10 Marks)**
    b. Write midpoint ellipse algorithm with explanation.   **(10 Marks)**

2   a. Digitize a line from (20, 10) to (30, 18) on a raster screen using Bresenham's straight line algorithm.   **(05 Marks)**
    b. Write a C code using open GL to draw a line using DDA algorithm.   **(10 Marks)**
    c. Explain openGL features for graphics programming.   **(05 Marks)**

3   a. Explain how interior and exterior regions are identified using odd parity rule. **(05 Marks)**
    b. Write a function to perform 4 connected boundary fill and explain how 8-connected boundary fill is better.   **(07 Marks)**
    c. Using openGL write the code for circle drawing using midpoint circle generation algorithm and explain 8 way symmetry of a circle.   **(08 Marks)**

4   a. Describe how you can achieve two dimensional transformation of reflection and shear.
                                                                            (10 Marks)
    b. Explain any five openGL two dimensional viewing function with syntax and their relevance.
                                                                            (10 Marks)

5   a. Describe the procedure to map a clipping window into a normalized view port. **(10 Marks)**
    b. Explain Weiler-Atherton polygon clipping in detail.   **(10 Marks)**

6   a. Explain Cohen-Sutherland line clipping algorithm in detail.   **(10 Marks)**
    b. How is an object rotated in a three dimensional axis? Bring out in detail how to general three dimensional composite rotations can be achieved.   **(10 Marks)**

7   a. Justify the need for 'Projection' and list different projection techniques with brief explanation.   **(10 Marks)**
    b. Describe Bezier method of curve generation.   **(10 Marks)**

8   Write short notes on:
    a. Homogeneous coordinates Vs Screen coordinates.
    b. 2D transformation Vs 3D transformations.
    c. Text clipping.
    d. Traditional animation techniques.   **(20 Marks)**

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