USN ☐☐☐☐☐☐☐☐☐☐

Third Semester MCA Degree Examination, Aug./Sept.2020
Computer Graphics

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. What is openGL? Explain openGL point functions and GL – line functions with examples. **(08 Marks)**

  b. Define :
    i) Screen coordinates
    ii) Absolute coordinates. **(04 Marks)**

  c. Explain simple DDA algorithm. **(08 Marks)**

2 a. Explain midpoint circle drawing algorithm which calculates of way symmetry with necessary expressions. Calculates the co-ordinate positions for plotting circle with radius r = 15 and centre (0, 0). **(10 Marks)**

  b. Explain boundary fill algorithm and flood fill algorithm in brief. **(10 Marks)**

3 a. Explain all two dimensional transformations with homogenous matrix notations. **(10 Marks)**

  b. What is composite transformation and write composite matrices for translation and scaling. **(05 Marks)**

  c. Explain general pivot point rotation with matrix notations. **(05 Marks)**

4 a. Explain three dimensional reflection and shearing transformations. **(06 Marks)**

  b. Describe basic openGL geometric transformation functions. **(04 Marks)**

  c. Write a program to create (without using built-in function) to cube by implementing reflection algorithm along xy–plane, yz–plane and xz–plane. **(10 Marks)**

5 a. Define window and viewport. Derive the transformation matrix for world coordinates to viewport coordinates along with pipeline. **(10 Marks)**

  b. What are different types of clipping operations? Explain Cohen – Sutherland line clipping algorithm. **(10 Marks)**

6 a. Describe different 3D viewing concepts. **(10 Marks)**

  b. Explain various 3D viewing coordinate parameters and reference frame. **(10 Marks)**

7 a. Explain orthogonal and oblique parallel projection with matrix notations. **(12 Marks)**

  b. Define perspective projection. Derive perspective projection transformation matrices. **(08 Marks)**

8 a. Derive Bezier curve equations and list its useful properties of Bezier curves. **(10 Marks)**

  b. What is computer animation? Explain different traditional techniques used for computer animation. **(10 Marks)**

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