TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2078 Chaitra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Computer Graphics (*EX 554*)

1. What is pixel and pixel depth? Let the resolution of screen is 1024×512. What is the memory captured by the frame buffer that uses primary color for display? [2+3]

2. Derive the p-value for midpoint circle algorithms scanning towards anti clockwise direction starting from $(r,0)$. [7]

3. Compare and contrast between Digital Differential Analyzer line drawing algorithm and Bresenham's Line drawing algorithm. [3]

4. Scale the triangle with vertices A $(1,1)$, B $(4,4)$ and C $(2,3)$ to double along horizontal direction and triple of vertical direction about point $(2,3)$. [6]

5. Use Cohen Sutherland clipping Method to clip a line starting from A $(-1,5)$ and ending at B$(3,8)$ against the window having its lower corner at $(-3,1)$ and upper right corner at $(2,6)$. [4]

6. Why we need projection in computer graphics? How can you reflect an object about an arbitrary axis in 3D? Explain each step in detail. [8]

7. Define Hermite curve. Write the equation of Bezier curve with four control points p_1 $(2,2,0)$, p_2 $(2,3,0)$, p_3 $(3,3,0)$, and p_4 $(3,2,0)$. Find the coordinate pixel of the curve for $u = 0$, $1/4$, $1/2$, $3/4$ and also plot the curve on graph. [8]

8. Differentiate boundary representation and space partitioning representation of polygon surface. If three vertices of a polygon surfaces in anticlockwise direction are V1 $(1,0,0)$, V2 $(1,1,0)$ and V3 $(1,0,1)$. Calculate normal vector of that surface. [4+4]

9. How Scan Line Method is used for visible surface Detection? Explain in detail. [8]

10. Define Illumination and surface rendering. Explain basic illumination model. [2+6]

11. Explain Gouraud shading method with its advantages and disadvantages. [8]

12. Explain the importance of open GL. Write a program to display Red Rectangle in open GL. [7]

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