TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Chaitra

Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	BEX, BCT	Pass Marks	32
Year / Part	III / I	Time	3 hrs.

Subject: - Computer Graphics *(EX 603)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt *All* questions.
✓ The figures in the margin indicate *Full Marks*.
✓ Assume suitable data if necessary.

1. Define computer graphics. Illustrate about components for computer graphics. [2+4]

2. Differentiate between DDA and Bresenhamline drawing algorithm. Explain Bresenham line drawing algorithm and use this algorithm to draw a line with end points (25,20) and (15,10). [2+8]

3. Write matrix for 2D reflection about axes. Derive the transformation matrix responsible for the reflection of 2D object about line y+x=0. [2+6]

4. Explain with a block diagram about the 3D viewing pipeline. Along with the transformation matrix, describe how perspective projection is performed? [4+4]

5. Find the coordinates at U=0.25, 0.5, and 0.75 with respect to the control points (10,10), (15,25), (20,30), and (25,5) using Bezier function. Draw your curve with given control points. [8]

6. How can a 3D-Dimensional object be modelled? How a normal to a plane of this object is calculated? [3+3]

7. Explain backface detection algorithm. Determine whether two surfaces of a object with normals $2\bar{i} - 3\bar{j} + 4\bar{k}$ and $\bar{i} + \bar{j} - 2\bar{k}$ respectively, viewed from a direction given by $\bar{i} - \bar{j} + \bar{k}$ are backface or frontface. [5+5]

8. How polygon is drawn in OpenGL? How lighting is applied to this polygon surface? [2+3]

9. Derive the expression to calculate the intensity of Specular Reflection in the presence of Point light source. Also write the expression for multiple light sources. How do you consider the distance to calculate the intensity for Specular Reflection? [8+4]

10. Write down an algorithm for intensity interpolation shading scheme. [7]

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