BCSE-III Computer Graphics Class Test –I
Attempt All Questions (Set-1), Full Marks: 30

1. Use the Bresenham's method to derive decision parameters for generating points along a straight line path with slope in the range $0 < m < 1$. Generate the intermediate set of points for a line with endpoints (20,10) and (30,18). (8+7=15)

2. a) Write an algorithm to clip a convex polygon using Sutherland-Hodgeman method.
   b) Differentiate between boundary fill and flood fill algorithms. (10+5=15)

BCSE-III Computer Graphics Class Test –I
Attempt All Questions (Set-2), Full Marks: 30

1. Write an algorithm to scan convert the interior of a polygon into a solid colour. Briefly discuss two algorithms for determining input regions for any input set of vertices. (10+5=15)

2. a) Write the basic steps of Cohen-Sutherland line clipping Algorithm.
   b) Show that the transformation matrix for reflection about the line $y = x$, is equivalent to a reflection relative to the $x - axis$, followed by a counter-clockwise rotation of 90°. (10+5=15)

BCSE-III Computer Graphics Class Test –I
Attempt All Questions (Set-3), Full Marks: 30

1. a) Determine the form of the transformation matrix for a reflection about an arbitrary line with equation $y = mx + b$.
   b) Briefly discus about different Flat Panel display devices. ᐱᐸᗡ. (10+5=15)

2. Derive decision parameters for the midpoint ellipse algorithm assuming the start position as $(0, r_y)$ and points are to be generated along the curve path in clockwise direction. (15)

BCSE-III Computer Graphics Class Test –II

Attempt All Questions (Set-1), **Full Marks: 30**

1. Derive the transformation matrices for 3-D rotation. What is a 3-D viewing pipeline? Briefly discuss different 3-D viewing parameters. (3+2+3=8)
2. What are quadric surfaces? Derive the equation of a sphere. (3+3=6)
3. What are interpolation and approximation splines? what is a convex hull? what is a control graph? Derive the equation of a cubic Bezier curve. (2+2+2+4=10)
4. Derive the formulation for Phong specular reflection model. 6

BCSE-III Computer Graphics Class Test –II

Attempt All Questions (Set-2), **Full Marks: 30**

1. What are the different types of projections? Derive the homogeneous coordinate formulation for perspective projection. (4+3=7)
2. What is CSG modelling of 3-D objects? Give an example. How ray-casting is used to implement CSG operators? 8
3. Discuss the depth-buffer algorithm. How it can be modified for transparent surfaces? (4+3=7)
4. Briefly discuss the advantages and disadvantages of Gouraud surface rendering model. 4
5. Discuss the ray-tracing tree with an example. 4

BCSE-III Computer Graphics Class Test –II

Attempt All Questions (Set-3), **Full Marks: 30**

1. How to model objects in 3-D? What are Polygon tables? (3+3=6)
2. What is octree encoding? What are the different types of fractals? (3+3=6)
3. Briefly discuss the Scan-line method for surface detection. 4
4. What are Lambertian reflectors? Derive the formulation for diffuse and specular reflections from multiple light sources. (2+8=10)
5. Briefly discuss Phong surface rendering model.

$$\sum_{i=0}^{3} I_d K_d (\vec{n} \cdot \vec{l}) + I_s K_s (\vec{v} \cdot \vec{r})^{n_s}$$