

Con. 6540-13.

GS-7110

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**.(2) Attempt any **four** questions out of remaining **six** questions.(3) Assume **suitable** data if **necessary** and justify the **same**.

1. (a) Explain the method to draw a thick line using Bresenham's algorithm. 5
 (b) Differentiate between Image space and Object space. 5
 (c) What is aliasing ? Explain some antialiasing techniques. 5
 (d) Derive the transformation matrix to magnify the triangle A (0, 0), B (1, 2) C (3, 2) to twice its size so that the point C (3, 2) remain fixed. 5

 2. (a) Explain Liang-Barsky line clipping algorithm. Apply the algorithm to the line with co-ordinates (30, 60) and (60, 25) against the window $(x_{min}, y_{min}) = (10, 10)$ and $(X_{max}, Y_{max}) = (50, 50)$. 10
 (b) Explain parallel and perspective projections. Perform a perspective projection of the unit cube when the centre of projection is at $x_c = 10$ $y_c = 10$ on to $z = 0$ plane. 10

 3. (a) Derive the composite transformation matrix for reflection of an object about a line $y = mx + c$. Apply the derived matrix for the object A (4, 2) B (5, 3) C (6, 2) D (7, 1) on to the line $y = 2x$. 10
 (b) Derive the midpoint algorithm for ellipse generation. 10

 4. (a) Explain Weiber-Atherton algorithm for polygon clipping. What are its advantages over other polygon clipping algorithms ? 10
 (b) Explain the different raster techniques and the transformation associated with it. 10

 5. (a) Explain Painter's algorithm. 10
 (b) Explain Gourand and Phong shading with their advantages and disadvantages. 10

 6. (a) Explain computer assisted animation and frame-by-frame animation concepts. 10
 (b) Explain scan line fill algorithm with some suitable examples. 10

 7. (a) Explain RGB and CMY color models. 10
 (b) State the properties of Bezier curves. How can a Bezier surface be generated from a Bezier curve ? 10
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