

FACULTY OF SCIENCE

M.Sc. (I Semester) (Computer Science) Examination, April/May 2005

COMPUTERS GRAPHICS

Paper—1.5

Time : Three Hours]

[Maximum Marks : 100

SECTION—A

(Marks :  $8 \times 5 = 40$ )

(Short Answer Type)

1. Explain Raster Scan displays.
2. Write about non-zero winding number rule for finding inside-outside point of a polygon.
3. Write about curve attributes.
4. Write transformation matrices in 2-D for translation and scaling with respect to origin.
5. Write about world coordinates, screen coordinates and normalized device coordinates.
6. Derive viewing transformation relation.
7. Write about plane equation.
8. Write about back-face detection.

SECTION—B

(Marks :  $4 \times 15 = 60$ )

(Essay Answer Type)

9. (a) (i) Write mid-point algorithm for drawing a circle.  
(ii) Write about flood-fill algorithm.

OR

- (b) Write mid-point algorithm for drawing an ellipse.
10. (a) (i) Show that rotation (in 2-D) about the origin can be done by three shear transformations.

(ii) Derive the matrix for rotation about an arbitrary point in 2-D.

**OR**

(b) (i) Derive transformation matrix (in 2-D) for reflection about the line  $y = x$ .

(ii) Write about homogeneous coordinates in 2-D.

11. (a) Explain Liang-Barsky Line Clipping method.

**OR**

(b) Explain Sutherland-Hodgeman Polygon Clipping and a note on Weike-Atherton polygon clipping.

12. (a) (i) Explain the method of obtaining transformation matrix for rotation about an arbitrary axis in 3-D.

(ii) Explain about Bezier Curves.

**OR**

(b) Explain about parallel and perspective projections and derive transformation matrix for oblique parallel projection.