

Code No.: ETCS 210

L T C

Paper: Computer Graphics

3 1 4

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Transformation, Projections, and Clipping Algorithms: Bresenham's Line Drawing Algorithm, Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, Sutherland-Cohen Clipping Algorithm.
[No. of Hrs. : 11]

UNIT – II

Curves and Surfaces: Bresenham's Circle Drawing Algorithm, Bezier Curves, 4 point and 5 point Bezier curves using Bernstein Polynomials, Conditions for smoothly joining curve segments, Bezier bi-cubic surface patch, B-Spline Curves, Cubic B-Spline curves using uniform knot vectors, Testing for first and second order continuities [No. of Hrs: 11]

UNIT – III

Projection and Solid Modelling: Parallel Projection, Oblique Projection on xy plane, Isometric Projection, Perspective Projection, One Vanishing Point (V.P.) projection from a point on z axis, Generation of 2 V.P. Projection, Isometric Projection, Perspective, Projection, one vanishing Point (VP), projection from 0 point on z axis, Generation of 2 VP Projector & Projections, Solid Modelling.
[No. of Hrs: 11]

UNIT – IV

Shading and Hidden Surface Removal: Shading, Illumination Model for diffused Reflection, Effect of ambient lighting, distances, Specular Reflection Model, Computing Reflection Vector, Curved Surfaces, Polygonal Approximations, Gourard Shading, Phong Model, Hidden Surface Removal, Back Face Detection, Depth Buffer (Z-Buffer, A-Buffer) Method, Scan Line Method, Depth Sorting Method, Area Subdivision Method.
[No. of Hrs: 11]

TEXT BOOKS:

1. Foley et. al., "Computer Graphics Principles & practice", Addison Wesley, 1999.
2. David F. Rogers, "Procedural Elements for Computer Graphics", McGraw Hill Book Company, 1985.

REFERENCES BOOKS:

1. D. Rogers and J. Adams, "Mathematical Elements for Computer Graphics", MacGraw-Hill International Edition, 1989.
2. D. Hearn and P. Baker, "Computer Graphics", Prentice Hall, 1986.
3. R. Plastock and G. Kalley, "Theory and Problems of Computer Graphics", Schaum's Series, McGraw Hill, 1986.