

Paper Code: BCA 303

Paper ID: 20303

Paper: Computer Graphics

Pre-requisites: None

Aim: To understand the graphics applications and its use.

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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 12.5 marks.

UNIT – I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Applications, Development of Hardware and Software for Computer Graphics, Conceptual Framework for Interactive Graphics.

Overview, Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

Graphics Hardware

Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners, Antialiasing.

Clipping

Cohen- Sutherland Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision algorithm.
[T1][T2]

[No. of Hrs.: 12]

UNIT – II

Geometrical Transformations

2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, The Window-to-Viewport Transformation, Efficiency, Matrix Representation of 3D Transformations, Transformations as a Change in Coordinate System.[T1][T2][R3]

[No. of Hrs.: 10]

UNIT – III

Representing Curves & Surfaces

Polygon Meshes, Parametric Cubic Curves

Solid Modeling

Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling. [T1][T2]

[No. of Hrs.: 10]

UNIT – IV

Three Dimensional Viewing: Introduction, Representation of Three-dimensional objects, Projections, Parallel projections: Orthographic Projections, Oblique Projections. Perspective Projection, Three dimensional clipping, Three-dimensional Cohen-Sutherland clipping algorithm.

Hidden Surface Removal: Depth-Buffer(z-buffer) method, Depth-sorting Method(Painter's algorithm)[T1][T2]