

BCA-363: Computer Graphics

Maximum Marks: 100

Minimum Pass Marks: 35

Time: 3 hours

External: 80

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introduction to Computer Graphics; Interactive and Passive Graphics; Applications of Computer Graphics; Display Devices: CRT; Random Scan, Raster Scan, Refresh Rate and Interlacing, Bit Planes, Color Depth, Color Palette, Color CRT Monitor, DVST, Flat-Panel Displays: Plasma Panel, LED, LCD; Lookup Table, Interactive Input Devices, Display Processor, General Purpose Graphics Software, Coordinate Representations;

UNIT – II

Point-Plotting Techniques: Scan Conversion, Scan-Converting a Straight Line: The Symmetrical DDA, The Simple DDA, Bresenham's Line Algorithm; Scan-Converting a Circle: Circle drawing using Polar Coordinates, Bresenham's Circle Algorithm, Scan-Converting an Ellipse: Polynomial Method, Trigonometric Method; Polygon Area Filling: Scan-line Fill and Flood Fill Algorithms;

UNIT – III

Two-Dimensional Graphics Transformation: Basic Transformations: Translation, Rotation, Scaling; Matrix Representations and Homogeneous Coordinates; Other Transformations: Reflection, Shearing; Coordinate Transformations; Composite Transformations; Inverse Transformation; Affine Transformations; Raster Transformation;
Graphical Input: Pointing and Positioning Devices and Techniques

UNIT – IV

Two-Dimensional Viewing: Window and Viewport, 2-D Viewing Transformation
Clipping: Point Clipping; Line Clipping: Cohen-Sutherland Line Clipping Algorithm, Mid-Point Subdivision Line Clipping Algorithm; Polygon Clipping: Sutherland-Hodgman Polygon Clipping Algorithm;
Three-Dimensional Graphics: Three-Dimensional Display Methods; 3-D Transformations: Translation, Rotation, Scaling; Composite Transformations;

TEXT BOOKS:

- Donald Hearn, M. Pauline Baker, "Computer Graphics", PHI.
- Apurva A. Desai, "Computer Graphics", PHI, 2010

REFERENCE BOOKS:

- Newmann & Sproull, "Principles of Interactive Computer Graphics", McGraw Hill.
- Foley, "Computer Graphics Principles & Practice", Addison Wesley.
- Rogers, "Procedural Elements of Computer Graphics", McGraw Hill.
- Zhigang Xiang, Roy Plastock, "Computer Graphics", Tata McGraw Hill.
- D.P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI.