

CODE R7310503

III B.Tech I Semester (R07) Regular & Supplementary Examinations, November 2010
COMPUTER GRAPHICS

(Computer Science & Engineering, Information Technology, Computer Science & Systems
Engineering, Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the application areas of computer graphics.
(b) Discuss the raster- scan systems in detail.
2. (a) Write and explain the ellipse - generating algorithm using midpoint.
(b) Explain the boundary-fill and flood fill algorithms.
3. (a) Discuss the 2- D transformation with example.
(b) What is meant by composite transformation? How to generate rotations about any selected pivot point?
4. (a) Explain the cyrus- beck line clipping algorithm.
(b) Explain the process of window - to - viewport coordinate transformation.
5. (a) What is B- spline curve? What are its properties?
(b) Discuss the Phong shading for rendering a polygon surface.
6. (a) Explain an algorithm for three-dimensional clipping.
(b) Explain the three- dimensional viewing pipeline.
7. (a) Explain the back- face detection method.
(b) Explain the depth-sorting method for visible surface detection.
8. (a) Discuss the different ways of motions specifications.
(b) What is animation? Discuss the design of animation sequence.

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1. (a) Explain the working of Direct- view storage tubes (DVST).
(b) Explain the working of Raster- Scan displays.
2. (a) Write and explain the mid- point circle algorithm.
(b) Compare DDA algorithm and Bresenham's line drawing algorithm.
3. (a) Explain reflection and shear transformation obtain a transformation matrix for reflection about the diagonal $y=x$.
(b) Explain the transformation between coordinate systems with example.
4. (a) Explain the Sutherland- Hodgeman polygon chipping algorithm.
(b) What is meant by workstation transformation? How window- to- viewport transformation is performed?
5. (a) Explain the basic Ray- tracing algorithm.
(b) Discuss the Hermit curve and its properties.
6. (a) Give the transformation matrix, in homogeneous coordinate system, for three dimensional rotation along X, Y, & Z axis.
(b) Explain a 3-D reflection and shear transformation.
7. (a) Explain the scan- line method for visible surface detection.
(b) Explain the BSP - tree method for determining object visibility.
8. (a) Explain the different techniques for controlling animation with its advantages & disadvantages.
(b) Write short note on computer animation languages.

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1. (a) List and explain the application areas of computer graphics.
(b) Explain the differences between Raster- Scan displays and Random- Scan displays.
2. (a) Write and explain DDA algorithm for line drawing.
(b) Explain the scan -line polygon fill algorithm.
3. (a) Derive the transformation matrix for reflection about a line $y=-x$.
(b) Discuss the basic transformations with its homogenous coordinates matrix representation.
4. (a) What is clipping? What is use of codes for each endpoint in the Cohen-Sutherland line-clipping algorithm?
(b) What is viewing transformation? Explain the two- dimensional viewing - transformation pipeline.
5. (a) Explain the boundary representation for 3-D graphics object using a set of surface polygons.
(b) Explain the parametric continuity conditions to ensure a smooth transition from one section of a curve to the next.
6. (a) Explain the three- dimensional viewing pipeline.
(b) What is meant by viewing coordinates? How to specify the view plane?
7. (a) Explain the area- subdivision method for visible- surface detection.
(b) Explain the algorithm for Octrees to get a correct display order for parallel projection.
8. (a) Discuss the different ways of motion specifications.
(b) Discuss the basic rules of animation and problems peculiar to animation.

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1. (a) Explain the working of Flat- panel displays.
(b) Explain the working of the following input devices.
 - i. Light pens
 - ii. Joysticks
2. (a) Write and explain Bresenham's line drawing algorithm.
(b) Explain the boundary -fill and flood- fill algorithm.
3. (a) Derive the scaling matrix to generate fixed- point scaling.
(b) Show that two successive translations are additive and two successive scaling operations are multiplicative.
4. (a) Explain the two- dimensional viewing pipeline.
(b) Explain the Cohen- Sutherland line clipping algorithm.
5. (a) What is a Bezier curve? What are its properties? Give the Bezier polynomial function.
(b) List the polygon shading methods and explain Gouraud shading.
6. (a) What is view volume? How it is generated using parallel projection & perspective projection.
(b) Explain an algorithm for three- dimensional clipping.
7. (a) Explain the Warnock's algorithm for visible surface determination.
(b) What is meant by List- priority algorithms? Explain the depth- sort algorithm for visible surface determination.
8. (a) Explain the steps for an animation sequence.
(b) What is meant by key- frame systems? Explain morphing with example.
