

Code No: 57049

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, March - 2017

COMPUTER GRAPHICS

(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

- 1.a) List various applications of Computer Graphics and also the input devices.  
 b) Explain about raster-scan systems with a sketch of its architecture.  
 c) Define 'Aspect Ratio'. What is 'Resolution'? How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 1280 by 1024 and a refresh rate of 60 frames per second. [5+5+5]
- 2.a) Describe step-by-step procedure to draw a line with endpoints (20, 10) and (30, 18) using Bresenham's line-drawing algorithm.  
 b) Explain Mid-Point Circle algorithm with an example. [7+8]
- 3.a) Illustrate Translation and Scaling 2D transformations.  
 b) Transform the unit square with parameter values  $sh_x = 1/2$  and  $y_{ref} = -1$  in the x-direction using 2D Shear transformation. Represent the transformation with necessary figures and equations.  
 c) What are the steps to carry out transformation between coordinates systems? [6+3+6]
- 4.a) Explain Sutherland-Hodgeman Polygon Clipping.  
 b) Discuss briefly about Cyrus-beck line clipping. [10+5]
- 5.a) State the properties of Bezier curves. What are 'Bezier Surfaces'?  
 b) Describe Phong Spectacular Reflection Model for illumination. [6+9]
- 6.a) What are the steps to obtain a composite matrix for rotation about an arbitrary axis, with the rotation axis projected onto the z-axis? Explain with the required figures and equations.  
 b) Write a note on View Volumes.  
 c) How to obtain general perspective-projection transformation? [7+4+4]
- 7.a) Provide a taxonomy of Visible-Surface Detection algorithms.  
 b) Present summary of the steps of Depth-Buffer algorithm.  
 c) Explain about Octree methods for detecting visible surfaces. [5+5+5]
- 8.a) Write in detail about Key Frame systems? What are 'Parameterized systems', 'Scripting Systems'?  
 b) What is 'Morphing'? Describe the process of Morphing in detail. [8+7]

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