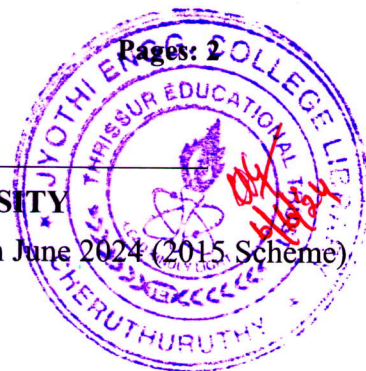


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S, FE) Examination May 2024/ S7 (PT) (S,FE) Examination June 2024 (2015 Scheme)

**Course Code: CS401****Course Name: COMPUTER GRAPHICS**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 4 marks.*

Marks

- | | | |
|----|---|-----|
| 1 | Describe the working of Refresh Cathode-Ray Tubes with diagram. | (4) |
| 2 | Write the flood fill algorithm to fill a polygon. | (4) |
| 3 | Write Bresenham's Line drawing algorithm. | (4) |
| 4 | Illustrate the rotation of 2D objects with proper equations. | (4) |
| 5 | Explain window to viewport coordinate transformation. | (4) |
| 6 | What are the different tables used for representing polygon surfaces? | (4) |
| 7 | Illustrate the concept of Vanishing point. | (4) |
| 8 | Describe the relationship between pixels with suitable examples. | (4) |
| 9 | Describe the various classifications of the visible-surface detection algorithms. | (4) |
| 10 | Explain the Sobel edge detector in detail. | (4) |

PART B*Answer any two full questions, each carries 9 marks.*

- | | | |
|----|--|-----|
| 11 | a) Explain Beam Penetration method. | (4) |
| | b) Explain the architecture of raster graphics system with suitable diagrams. | (5) |
| 12 | a) Draw the line segment from pixel coordinate (5,5) to (13,9) using Bresenham's line drawing algorithm. | (5) |
| | b) Write the boundary fill algorithm for filling a polygon using eight connected approach. | (4) |
| 13 | a) Define the terms: (i) Aspect Ratio (ii) Resolution | (4) |
| | b) Write DDA line drawing algorithm. | (5) |

PART C*Answer any two full questions, each carries 9 marks.*

- | | | |
|----|--|-----|
| 14 | Use Cohen Sutherland algorithm to clip line P1(10,30) and P2(80,90) against a window lower left-hand corner (20,20) and upper right-hand corner (90,70). | (9) |
|----|--|-----|

- 15 a) Explain Sutherland Hodgeman polygon clipping algorithm with example. (9)
- 16 a) Show that the composition of two rotation is additive by concatenating the matrix representation for $R(\Theta_1)$ and $R(\Theta_2)$. (4)
- b) Describe Weiler-Atherton polygon clipping algorithm with suitable example. (5)

PART D

Answer any two full questions, each carries 12 marks.

- 17 a) Describe parallel and perspective projection. (8)
- b) Illustrate Back face removal in visible surface detection. (4)
- 18 a) Give the digital image representation of an image. (2)
- b) Describe the fundamental steps in image processing with a neat diagram. (10)
- 19 a) Explain Z Buffer Algorithm for hidden surface elimination. (4)
- b) Explain the working of any two edge detection methods. (8)
