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Question Paper Code : 75488

5 Year/M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fourth Semester

Software Engineering

ESE 044 — COMPUTER GRAPHICS

(Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is 'Resolution' of a display device? How is it measured?
2. How is 'Random scanning' performed?
3. What is the principle behind scan line polygon fill procedure?
4. What are the techniques used to draw thick lines in computer graphics applications?
5. Give the homogeneous transformation matrix for 2D reflection with respect to the line $Y = X$.
6. What is 'point clipping'?
7. Depict the 3D viewing pipeline.
8. What are the two basic classes of 3D object representations?
9. Why should we detect visible surfaces?
10. What is 'frame rate' for animation?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Write short notes on flat panel display devices. (8)
(ii) Describe the complete architecture of a raster graphics system. (8)

Or

- (b) (i) Write notes on any four standard input devices. (8)
(ii) What are the applications of computer graphics in the area of visualization? (8)

12. (a) (i) Brief the steps in Bresenham's line drawing procedure. (8)
(ii) Use Bresenham's line drawing procedure to compute points on a triangle with vertices at $[(2,2), (6, 2), (4, 6)]$. (8)

Or

- (b) (i) Present any one of the popular approaches for antialiasing of a line. (8)
(ii) Explain the circle drawing procedure. (8)
13. (a) (i) What is window-viewport transformation? What is its significance in computer graphics applications? (8)
(ii) Derive the transformation matrix for scaling a square at $[(1,1),(3,1),(3, 3),(1,3)]$ with respect to the midpoint of one of the diagonals, using non-uniform scaling factors 1 and 2, respectively along X and Y axes. Find the new position of the square. (8)

Or

- (b) Explain any popular line clipping procedure, with an example. (16)
14. (a) (i) What is polygonal mesh modeling? Demonstrate mesh modeling for a standard unit cube. (8)
(ii) What do you know about Bezier curves? Discuss. (8)

Or

- (b) (i) Give the 3D homogeneous transformation matrices for basic 3D transformations. (8)
(ii) Derive the transformation matrix for parallel projection. (8)
15. (a) Describe a technique, one each, for image space and object space methods of visible surface detection algorithms. (16)

Or

- (b) Write notes on the popular animation techniques used in computer graphics applications. (16)
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