

Total No. of Questions—12]

[Total No. of Printed Pages—4+1

[3862]-223

S.E. (I.T.) (Second Sem.) EXAMINATION, 2010

COMPUTER GRAPHICS

(2008 COURSE)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer *three* questions from Section-I and *three* questions from Section-II

(ii) Answers to the two Sections should be written in separate answer-books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Figures to the right indicate full marks.

(v) Use of electronic pocket calculator is allowed.

SECTION I

1. (a) Consider the line from (0, 0) to (−6, −6). Use the simple DDA algorithm for rasterizing this line. [6]

(b) Explain the difference between raster scan and vector scan displays. [4]

(c) Draw and explain the following input devices : [8]

(i) Trackball

(ii) Joystick

(iii) Light pen system

(iv) Touch panel

Or

2. (a) Explain and derive the expression for the decision parameter in mid-point line drawing algorithm. [8]
- (b) Explain display file structure. Why is display file interpreter used ? Which are the commands used in display file interpreter ? [6]
- (c) Explain Stroke and Star-burst method for character generation. [4]
3. (a) Scale the polygon with co-ordinates A(2, 5), B(7, 10) and C(10, 2) by 3 units in x-direction and 4 units in y-direction. [6]
- (b) A point (5, 4) is rotated anticlockwise by an angle of 45. Find rotation matrix and the resultant point. [6]
- (c) Explain the method for testing a pixel inside or outside a polygon. (even-odd method). [4]

Or

4. (a) Find the transformation matrix that transform the given square ABCD to half its size with centre still remaining at the same position. The co-ordinates of the square are : A(1, 1), B(3, 1), C(3, 3), D(1, 3) and centre at (2, 2). Also find the resultant co-ordinates of square. [8]
- (b) What is homogeneous co-ordinate system ? Explain the need of homogeneous co-ordinates. [4]

- (c) Translate the polygon with co-ordinates A(2, 3), B(5, 9) and C(8, 9) by 6 units in x -direction and 3 units in y -direction. [4]

5. (a) Explain the ways of projecting 3D objects onto 2D screen in detail. [8]

- (b) What is Spline ? Give definitions of spline curve and spline surface. Explain with neat diagrams, which are the different parametric continuity conditions ? [8]

Or

6. (a) What is meant by quadric surfaces ? Explain any *two* quadric surfaces with figure, its equation and parametric form : [8]

- (b) Write short notes on (Attempt any *two*) : [8]

(i) Polygon tables

(ii) Polygon surfaces

(iii) Curved lines and surfaces.

SECTION II

7. (a) What are the different ways in which motions of the objects can be specified ? Explain each in brief. [8]

- (b) What is Animation ? What are the basic rules required for Animation ? [6]

- (c) Explain CIE Chromaticity diagram. [4]

Or

8. (a) Explain various controlling methods of Animation. [5]
- (b) Explain difference between RGB and CMY(K) color model. [4]
- (c) Write short notes on :
- (i) Key Frame Systems
 - (ii) Animation Languages
 - (iii) Morphing [9]
9. (a) What is jittering ? State the advantages of distributed ray tracing. [4]
- (b) Explain the following illumination models : [12]
- (i) Phong illumination
 - (ii) Diffuse reflection
 - (iii) Specular reflection

Or

10. (a) Write short notes on : [9]
- (i) Z Buffer
 - (ii) RGB Color Model
 - (iii) Ray Tracing.
- (b) What is shading ? What are the different steps required to shade an object using Gaurads Shading Algorithm ? [7]

11. (a) Explain in brief Monte-Carlo method for rendering. [5]
- (b) Explain Bezier Curve Generation using Midpoint Subdivision. [6]
- (c) Explain the algorithm to draw fractal lines. [5]

Or

12. (a) Explain features of 3D Studio/Maya Graphics tool. [7]
- (b) Write short notes on : [9]
- (i) Texture Mapping
- (ii) Anti-aliasing
- (iii) Post-filtering and GPU.