Total No. of Questions—12] [Total No. of Printed Pages—4+1

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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

P.T.O.

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.