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Total No. of Questions—12]

[Total No. of Printed Pages—4+1

Seat No.	
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[4262]-213

S.E. (Information Technology) (Second Semester)

EXAMINATION, 2012

COMPUTER GRAPHICS

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 100

- N.B. :—** (i) Answer question 1 or 2, 3 or 4 and 5 or 6 from Section I and question 7 or 8, 9 or 10 and 11 or 12 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) Assume suitable data, if necessary.

SECTION I

1. (a) Explain Bresenham's line drawing algorithm in detail. Rasterise the following line using Bresenham's line generating algorithm P1 (5, 8) – P2 (9, 5). [8]

P.T.O.

(b) Define : [6]

(i) Aspect Ratio

(ii) Pixel

(iii) Resolution.

(c) Explain Display File structure. [4]

Or

2. (a) What are Scanners ? Explain in detail the working principle of scanners. List different type of scanners. [8]

(b) What are the different methods for character generation ? Explain star bust method in detail. [4]

(c) Explain DDA line generation algorithm in detail with an example. [6]

3. (a) Explain the different types of polygons. Also explain the various methods for testing a pixel inside a polygon. [6]

(b) Find the final co-ordinate of triangle

A(2, 4), B(4, 6), C(2, 6)

after the reflection about the line $x - 2y = -4$. [10]

Or

4. (a) Magnify the triangle $P(0, 0)$, $Q(2, 2)$ and $R(10, 4)$ to four times its size while keeping $R(10, 4)$ fixed. [8]
- (b) Explain the scan line polygon filling algorithm. [5]
- (c) Explain homogeneous co-ordinate system. Give the homogeneous coordinate matrices for rotation and scaling. [3]
5. (a) Compare Bezier and B-Spline techniques for curve generation and discuss their properties. [8]
- (b) Explain parallel and Perspective Projections also state their types. [8]

Or

6. (a) Write short notes on : [8]
- (i) Polygon Meshes
- (ii) Quadratic Surfaces.
- (b) Obtain 3D matrices for : [8]
- (i) Reflection relative to coordinate axes
- (ii) Reflection relative to plane.

SECTION II

7. (a) Explain different steps used in design of animation sequence. [8]
(b) Explain different methods to specify motions of objects in an animation sequence. [8]

Or

8. (a) Explain the following color model : [8]
(i) HSV color model
(ii) YIQ color model.
(b) Explain raster animations and computer animation languages. [8]
9. (a) Explain specular reflection with neat diagram. [4]
(b) What is the basic purpose of Ray tracing algorithm. Explain ray tracing to find shadows. [6]
(c) Explain space-subdivision method to reduce ray surface intersection calculation. [6]

Or

10. (a) Compare Gouraud shading with Phong shading. [8]
(b) Explain the following : [8]
(i) Diffuse reflection
(ii) Ray tracing to find reflection.

11. (a) Explain bump mapping and frame mapping. [6]

(b) Write short notes on : [12]

(i) Shadows

(ii) GPU

(iii) Fractal lines and surfaces.

Or

12. (a) Explain construction of Bezier curve with its four control points. [6]

(b) Write short notes on : [6]

(i) Koch curve

(ii) Fractal and topological dimensions.

(c) Explain features of any Graphics tool that you have studied. [6]