

Total No. of Questions—12]

[Total No. of Printed Pages—4+2

Seat No.	
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[4162]-213

S.E. (Information Technology) (Second Semester) EXAMINATION, 2012

COMPUTER GRAPHICS

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 100

N.B. :- (i) Answer Q. Nos. 1 or 2, 3 or 4, 5 or 6 from Section I and Q. Nos. 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.

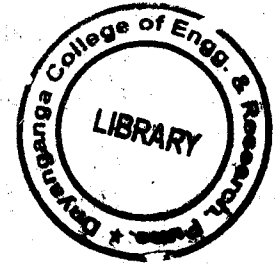
(v) Assume suitable data, if necessary.

SECTION I

1. (a) Explain Vector Generation principal for gentle and sharp slope lines. [4]

(b) What is aliasing ? Explain different anti-aliasing techniques. [8]

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- (c) Explain display file structure. Why is display file interpreter used ? Which are the commands used in display file interpreter ? [6]

Or

2. (a) Explain DDA line generation algorithm. Rasterize the line segment with starting point as $A(1, 0)$ and end point as $B(5, 7)$. [8]
- (b) Differentiate between Raster scan and Vector scan display systems. [4]
- (c) Explain various methods for character generation with example. [6]
3. (a) Explain homogeneous coordinate system. What is the need of homogeneous coordinates ? Give the homogeneous coordinates matrices for the 2D transformation : translation, rotation and scaling. [8]
- (b) Translate the polygon $A(5, 7)$, $B(7, 11)$ and $C(12, 15)$ by 4 units in x -direction and 6 units in y -direction. [4]
- (c) Explain even-odd method for testing a pixel inside or outside the polygon. [4]

Or

4. (a) Define polygon. Explain different types of polygon with example. [4]
- (b) Find out the final coordinates of a figure bounded by coordinates A(1, 1), B(3, 4), C(5, 7) and D(10, 3) when rotated about a point (8, 8) by 30 in clockwise direction and scaled by two units in x -direction and three units in y -direction. [8]
- (c) Give the pseudocode for boundary fill algorithm for polygon filling. [4]
5. (a) Which are the different types of projections ? Explain any one in detail with mathematical treatment. [8]
- (b) What is meant by quadric surfaces ? Explain any two quadric surfaces with diagram and equations in both implicit and parametric form. [8]

Or

6. (a) Explain how an object is rotated about an arbitrary axis. [10]

(b) Write short notes on (any two) : [6]

(i) Polygon Meshes

(ii) Polygon Tables

(iii) Plane Equation.

SECTION II

7. (a) What is animation ? Explain the basic rules required for animation. [8]

(b) What are the different steps in animation sequence ? Explain each step in brief. [6]

(c) Differentiate between RGB and CMYK color model. [4]

Or

8. (a) Explain the terms tints, tones and shades in the terminology of color mixing. [4]

(b) Explain YIQ color model. Explain how YIQ to RGB conversion is done. [6]

(c) What are the different animation languages that are used ? Explain each with an example. [8]

9. (a) Explain Ray tracing with a proper figure for the following : [8]
- (i) Ray tracing to solve hidden surface problem for every pixel
 - (ii) Ray tracing to find shadows
 - (iii) Ray tracing to find reflections.
- (b) Define shading. What are the different methods used for shading.
Explain Gouraud Shading method used for shading. [8]

Or

10. (a) Explain the principle of pinhole camera. Which are the various secondary rays that are generated while viewing an object ? [8]
- (b) What is ray tracing ? Explain how the ray is represented in its parametric form. [4]
- (c) Explain Specular reflection with figure in detail. [4]
11. (a) Define Fractal with example. Give various methods in which fractals are classified. [8]
- (b) Explain Bezier curve generation using Midpoint subdivision algorithm. Also give the properties of Bezier curve. [8]

Or

12. (a) Explain how fractal line algorithm can be used for generating fractal surface. [8]
- (b) Write short notes on any two : [8]
- (i) Hilbert's Curve
 - (ii) Rendering Equation
 - (iii) GPU
 - (iv) Texture Mapping.

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