

3. What is segment? What is segment table?

Explain the need of segmentation in computer graphics. Also explain the opening of a segment.

4. Write the properties of Bezier curve. Find

the equation of the Bezier curve which passes through $(0,0)$ and $(-4,2)$ and controlled through $(14, 10)$ and $(4, 0)$.

P_2 P_3
 P_3 P_1

5. Write short notes on -

(a) Illumination Model

(b) Character or Text Generation method

13. Explain the steps in Bresenham's line drawing algorithm.
14. Consider a raster system with a resolution of 640×480 . What is the size of frame buffer (in bytes) needed for the system to store 12 bits / pixel?
15. Why we need interactive techniques? Name various types of interactive techniques.

Section-B

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries 20 marks. (20x3=60)

1. Explain DDA line drawing algorithm. What are the drawbacks of DDA line drawing algorithm? How they are removed in Bresenham's algorithm? Find equation of Bezier curve which passes through points (0,0) and (-2,1) and is controlled through points (7,5) and (2,0).

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3. Write short notes on:

- (i) Anti-aliasing vs. aliasing.
- (ii) Multiple windowing.
- (iii) Painter's algorithm.
- (iv) String (character) clipping.

4. Explain the following.

(a) Liang- Barsky line clipping Algorithm.

(b) Sutherland Hodgeman Polygon clipping Algorithm.

5. What is hidden surface elimination? How does the basic scan line method determine which surface are hidden?

6. What do you mean by parallel and perspective projection? Derive a matrix for the projection of a point $p(x,y,z)$ onto a projection plane at a distance z_p from the origin and perpendicular to z-axis.

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Explain the steps in algorithm.

14. What is Orthogonal Projection? Write also its various types in brief.
15. What is shading? Differentiate between Phong Shading and Gouraud Shading.

Section-B

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries 20 marks. (20x3=60)

1. Explain the Midpoint Circle Generation Algorithm. Apply midpoint circle drawing algorithm to draw a circle of Radius of $r=10$
2. What is Projection? What are the various types of projection explain them in detail? Consider a line segment AB with end point A(4,3,2) and B(8,3,2). Find out perspective projection of AB Onto the plane $X=0$ from the centre of projection at $X=-4$.
3. What are Bezier and B-Spline curves? Distinguish between Bezier and B-Spline curves. Explain the use of Blending Function in Curves Generation.

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4. Describe the working of Raster Refresh Display Tube. What are the drawbacks of DDA line drawing algorithm? How they are removed or minimized in Bresenham's algorithm? Digitize a line with end point (20, 10) and (30, 18) using Bresenham's straight line algorithm.
5. Write short note on any four of the following:
- Isometric and Oblique Projection.
 - Character or Text Generation Method.
 - Visible Surface Detection Method
 - A-Buffer Algorithm
 - Painter's Algorithm
6. Explain the following:
- Liang-Barsky Line Clipping Algorithm
 - Sutherland Hodgeman Polygon Clipping Algorithm.

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6. Derive a general 2D-Transformation matrix for rotation about origin. What are the new coordinates of the point p (2,-4) after rotating 30° about the origin?
7. Explain Cohen-Sutherland line Clipping Algorithm with some example.
8. What are various two dimensional Geometric Transformation operation.
9. What is Illumination model? Describe its various types.
10. A frame buffer has a size 1024×1024 with 12 bit pixel. Compute the time required to load it, if transferred rate is 12 bit per second.
11. Write short note on composite transformation with some examples.
12. Explain the term Reflection and shearing for 2D transformation.
13. Explain the depth buffer (Z buffer) algorithm of hidden surface elimination

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can be written as
interval Δy from equation

Q1 - Explain DDA line drawing algorithm and its drawbacks.

CS-501/3401

B.Tech. [CS] (Semester-V) Exam.-2017 Computer Graphics

Time: Three Hours

Maximum Marks: 100

Note: Attempt questions from all the sections.

Section-A

(Short Answer Type Questions)

Note: Attempt any ten questions. Each question carries 4 marks. (10x4=40)

1. What is Frame Buffer? Differentiate between Bitmap and Pixmap.
2. How a viewport differs from the Window?
3. What are Polygon and its type? Explain Boundary-fill Algorithm.
4. Distinguish between Raster scan and Random scan system.
5. Explain the steps in Bresenham's line drawing algorithm.

CS-501/3401-S-120

What are the line drawing algorithms?

CS-501/3401

B. Tech. (CS) (Semester-V) Examination-2018

Computer Graphics

Time: Three Hours

Maximum Marks: 100

Note: Attempt questions from all the sections.

Section-A

(Short Answer Type Questions)

Note: Attempt any ten questions. Each question carries 4 marks. (4x10=40)

1. What is line clipping? Give Cohen Sutherland algorithm for line clipping.
2. Discuss various applications of computer graphics.
3. What is frame buffer? Explain.

CS-501/3401 D-120

- ✓ 4. What is window and view point? Explain. 13.
- ✓ 5. Distinguish between Raster scan and random scan system. 14.
- ✓ 6. Explain the categories of projection.
7. Explain back face removal algorithm. 15.
8. Write short note on composite transformation with some example.
- ✓ 9. What is scan conversion? Explain. Note
10. Explain coordinate transformation. 1.
11. What is shading? Differentiate between Phong shading and Gouraud shading?
- ✓ 12. Describe shearing transformation with suitable example.

11. What is polygon? Explain any polygon clipping algorithm.
12. Explain window to view port transformation in detail. What is window and view port.
13. Show that the Bezier Curve always touches the starting point (for $u = 0$) and the ending point (for $u = 1$).
14. Explain Back face removal algorithm.
15. Differentiate between Isometric projection and Oblique projection.

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SECTION - B

(Long Answer type questions)

Note : Attempt **any three** questions. Each question carries 20 marks. $3 \times 20 = 60$

1. Digitize a line from (1, 2) to (12, 18) on a raster screen using Bresenham's straight line algorithm. Compare it with line generated using a DDA algorithm.
2. Differentiate between Raster scan display and vector scan display. How are different shades of color generated on the RGB monitor? Explain any method for color display.

[P. T. O.]

6. Explain and write Bresenham line drawing algorithm.
7. Prove that the two successive rotations are additive.
8. Explain various polygon filling algorithms in detail.
9. Explain Cohen-sutherland line clipping algorithm.
10. Explain the terms projection plane, view plane and view-volume with reference to 3D graphics.

[P. T. O.]

5. Explain the steps in Bresenham's line drawing

algorithm.

7

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(c) Event Handling and Echoing

(d) Composite Transformation with some example.

6. Explain working Refresh CRT Monitors.

Explain the terms persistence, refresh rate, frame buffer, resolution and aspect ratio.

$$P(u) = \begin{matrix} -0- & \checkmark \\ u & M_{BG} \end{matrix}$$

$$ca) \begin{bmatrix} u^3 & u^2 & u & 1 \end{bmatrix} \begin{bmatrix} -1 & 3 & -3 & 1 \\ 3 & 6 & 3 & 0 \\ -3 & 3 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 14 & 10 \\ 0 & 0 \\ -7 & 2 \end{bmatrix}$$

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2

2. Differentiate between emissive and non-emissive displays. ⑦

3. Calculate the size of frame buffer needed by an 8 plane frame buffer each of red, green and blue, having 1024 x 768 resolution.

4. How can the light pen differentiate between two points on the screen when both have the same colour and intensity?

5. Discuss with examples the various interactive input methods and their modes of operation.

3

CS-501/3401

B.Tech. (Semester-V) Exam.-2016

(Computer Science and Engineering)

Computer Graphics

Time : Three Hours


Maximum Marks : 100

Note : Attempt questions from all sections.

SECTION - A

(Short-answer Type Questions)

Note : Attempt **any ten** questions. Each question carries 4 marks. $10 \times 4 = 40$

 Describe the role of animation in entertainment and scientific visualization.

[P. T. O.]

system.

5.

Explain the steps in Bresenham's line drawing

CS-501/3401

B. Tech. (CS) (Fifth Semester)

EXAMINATION, 2019

COMPUTER GRAPHICS

Time : Three Hours

Maximum Marks : 100

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 4 marks. $10 \times 4 = 40$

1. What is illumination model ? Describe its various types.
2. Explain the term reflection and shearing for 2D transformation.

(C-26) P. T. O.

[2]

CS-501/3401

3. Write a short note on 3-spline curve.
4. What is Phong shading ?
5. Define shadows and ray tracing.
6. What is window and viewport ?
7. Write down the steps involved in segment creation. How new segment can be created ?
8. Explain back face removal algorithm.
9. Find out the aspect ratio of the raster system using 8×10 inches screen and 100 pixel/inch.
10. What is Aliasing ?
11. What are methods of character generation ? Explain.
12. Find the matrix that represents rotation of an object by 45° about the origin.
13. What are the new coordinates of the point $P(2, -4)$ about the rotation ?
14. A triangle is defined by :

$$\begin{pmatrix} 2 & 4 & 4 \\ 2 & 2 & 4 \end{pmatrix}$$

(C-26)

[3]

CS-501/3401

Find the transformed coordinates after the following transformation :

- (i) 90° rotation about origin
- (ii) Reflection about line $y = -x$.

Section—B

(Long Answer Type Questions)

Note : Attempt any *three* questions. Each question carries 20 marks. $3 \times 20 = 60$

1. Write a short note on Blending function and also explain Bezier curve with its properties.
2. What are polygons and its types ? Write a short note on Boundary Fill Algorithm.
3. Explain drawback of DDA algorithm and with the help of diagram and equations explain Bresenham's line Algorithm.
4. Use the Cohen Sutherland algorithm to clip live $P_1(70, 20)$ and $P_2(100, 10)$ against a window lower left hand corner $(50, 10)$ and upper right hand corner $(80, 40)$.

(C-26) P. T. O.

5. What is hidden surface elimination ? How does the basic scan line method determine which surface are hidden ?
6. Write short notes on the following :
 - (i) Multiple windowing
 - (ii) Painter's algorithm
 - (iii) String (character) clipping

CS-501/3401

120

(C-26)

CS-501/3401

B. Tech. (CS) (Fifth Semester)

EXAMINATION, 2019

COMPUTER GRAPHICS

Time : Three Hours

Maximum Marks : 100

Note : Attempt questions from both Sections as directed.

Section—A

(Short Answer Type Questions)

Note : Attempt any *ten* questions. Each question carries 4 marks.

$$10 \times 4 = 40$$

1. What is illumination model ? Describe its various types.
2. Explain the term reflection and shearing for 2D transformation.

(C-26) P. T. O.

the Floyd-Warshall algorithm pair shortest path.

Greedy algorithm approach to an active

3. Write a short note on 3-spline curve.
4. What is Phong shading?
5. Define shadows and ray tracing.
6. What is window and viewport?
7. Write down the steps involved in segment creation. How new segment can be created?
8. Explain back face removal algorithm.
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13. What are the new coordinates of the point $P(2, -4)$ about the rotation?
14. A triangle is defined by:

$$\begin{pmatrix} 2 & 4 & 4 \\ 2 & 2 & 4 \end{pmatrix}$$

(C-26)

Find the transformed coordinates after the following transformation:

- (i) 90° rotation about origin
- (ii) Reflection about line $y = -x$.

Section—B

(Long Answer Type Questions)

Note : Attempt any three questions. Each question carries 20 marks. $3 \times 20 = 60$

1. Write a short note on Blending function and also explain Bezier curve with its properties.
2. What are polygons and its types? Write a short note on Boundary Fill Algorithm.
3. Explain drawback of DDA algorithm and with the help of diagram and equations explain Bresenham's line Algorithm.
4. Use the Cohen Sutherland algorithm to clip line $P_1(70, 20)$ and $P_2(100, 10)$ against a window lower left hand corner (50, 10) and upper right hand corner (80, 40).

(C-26) P.T.O.

[4]

CS-501/3401

5. What is hidden surface elimination? How does the basic scan line method determine which surface are hidden?
6. Write short notes on the following :
 - (i) Multiple windowing
 - (ii) Painter's algorithm
 - (iii) String (character) clipping