

**PALLAVAN COLLEGE OF ENGINEERING -THIMMA SAMUDRAM,
COMPUTER SCIENCE AND ENGINEERING
CS2401- COMPUTER GRAPHICS QUESTION BANK**

UNIT 1-2D PRIMITIVES

Output Primitives

1. Define – Aspect Ratio (**May/ June 2013**) (**2 Marks**)
2. Define – Computer Graphics (**2 Marks**)
3. List the applications of computer graphics. (**2 Marks**)
4. List the raster functions available in graphics packages. (**2 Marks**)

Line, Circle and Ellipse Drawing Algorithms

1. What are the disadvantages of DDA algorithm? (**Apr/May 2010**) (**2 Marks**)
2. Distinguish between symmetrical DDA and simple DDA. (**May/ June 2012**) (**2 Marks**)
3. What are the advantages of DDA algorithm? (**2 Marks**)
4. Explain the basic concept of midpoint ellipse drawing algorithm. Derive the decision parameter for the algorithm.
(**May/June 2013, Apr/May 2010, Nov/Dec 2009**) (**16 Marks**)
5. Explain the midpoint circle drawing algorithm. Assume 10 cm as the radius and co-ordinate origin as the centre of the circle.
(**May/June 2012, Nov/Dec 2011**) (**16 Marks**)
6. Explain the Bresenham's line drawing algorithm. (**Nov/Dec 2012, May/June 2009, Apr/May 2010, Apr/May 2008**) (**16 Marks**)
7. Consider a line from (0, 0) to (6, 7). Rasterize this line using simple DDA algorithm. (**8 Marks**)

Attributes of Output Primitives

1. What are the various attributes of a line? (**Nov/Dec 2011**) (**2 Marks**)
2. List the methods used for smoothly joining two line segments. (**Apr/May 2008**) (**2 Marks**)
3. What is pixel mask? (**2 Marks**)
4. What is meant by attribute parameter? (**2 Marks**)
5. What is line width? (**2 Marks**)
6. Write the command which is used to set color of line. (**2 Marks**)
7. What is color table? List the color codes. (**2 Marks**)
8. State the usage of marker symbol. (**2 Marks**)
9. What is inquiry function? (**2 Marks**)
10. What is tiling patterns? (**2 Marks**)
11. What is kerned character? (**2 Marks**)
12. Write the command used for specifying the thickness of line. (**2 Marks**)
13. Explain the attributes of output primitives. (**16 Marks**)

Two Dimensional Geometric Transformations

1. What is shearing? (**Nov/Dec 2012**) (**2 Marks**)
2. What is the need of homogeneous coordinates? (**2 Marks**)
3. Define – Translation (**2 Marks**)
4. What is composite translation? (**2 Marks**)
5. Define – Rotation (**2 Marks**)
6. Write the rotation equation and rotation matrix. (**2 Marks**)
7. Write the matrix representation for scaling and translation. (**2 Marks**)
8. Write the equation for homogeneous transformation. (**2 Marks**)
9. What is meant by composition of matrix? (**2 Marks**)

10. Write the composition transformation matrix for scaling, translation and rotation. (2 Marks)
11. Write short notes on general pivot point rotation. (2 Marks)
12. What is meant by general fixed point scaling? (2 Marks)
13. Differentiate uniform scaling from differential scaling. (2 Marks)
14. What is scaling transformation? (2 Marks)
15. What is reflection? (2 Marks)
16. Distinguish between bitBlt and pixBlt. (2 Marks)
17. Explain the two dimensional translation and scaling with an example. (May/June 2013, Apr/May 2010, Nov/Dec 2009) (16 Marks)
18. Explain the rotational transformation with suitable examples. (May/June 2013, Nov/Dec 2012, Apr/May 2010, Nov/Dec 2009) (16 Marks)

Two Dimensional Viewing

1. Differentiate window from view port. (Nov/Dec 2011, May/June 2009) (2 Marks)
2. Define – Viewing Transformation (2 Marks)
3. Write the equation for window to viewport transformation. (2 Marks)
4. Define – View Up Vector (2 Marks)
5. Draw the block diagram for 2D viewing transformation pipeline. (2 Marks)

Line, Polygon, Curve and Text Clipping Algorithms

1. What are the conditions for point clipping? (May/ June 2013) (2 Marks)
2. List the various text clipping methods. (Nov/Dec 2012) (2 Marks)
3. Define – Clipping (May/ June 2012) (2 Marks)
4. What is curve clipping? (2 Marks)
5. Define – Point Clipping (2 Marks)
6. What is line clipping and what are their parametric representations? (2 Marks)
7. State the role of region code. (2 Marks)
8. What is exterior clipping? (2 Marks)
9. Describe the Cohen-Sutherland line clipping algorithm with an example. (Nov/Dec 2012, May/June 2012, Nov/Dec 2011, May/June 2009, Apr/May 2008) (16 Marks)
10. Explain the curve clipping algorithm with suitable examples. (Nov/Dec 2012) (8 Marks)
11. Explain the transformations reflection and shearing. (16 Marks)
12. Describe the Sutherland Hodgeman polygon clipping. (16 Marks)
13. Distinguish between Liang Barsky line clipping and NLN line clipping. (16 Marks)

UNIT-II THREE-DIMENSIONAL CONCEPTS

Parallel and Perspective Projections

1. What is orthographic parallel projection? (Nov/Dec 2012) (2 Marks)
2. What is oblique projection? (Nov/Dec 2012) (2 Marks)
3. Differentiate parallel projection from perspective projection. (May/June 2012) (2 Marks)
4. What is parallel projection? (2 Marks)
5. What is projected reference point? (2 Marks)
6. What is center of projection? (2 Marks)
7. What is front plane and back plane? (2 Marks)
8. What is the necessity of using near plane and far plane? (2 Marks)
9. What is axonometric projection? (2 Marks)
10. What is meant by principal vanishing point? (2 Marks)
11. List the computer graphics standards. (2 Marks)
12. What are the different types of parallel projections? (2 Marks)
13. What is isometric projection? (2 Marks)

14. Distinguish between cavalier projection and cabinet projection. (2 Marks)
15. Differentiate parallel projection from perspective projection.
(Nov/Dec 2012, Nov/Dec 2011) (16 Marks)

Three-Dimensional Object Representations – Polygons, Curved lines, Splines, Quadric Surfaces

1. What are the advantages of B – spline over Bezier curve? (May/June 2013) (2 Marks)
2. What is spline? (Nov/Dec 2011, Nov/Dec 2012) (2 Marks)
3. Define – Quadric Surfaces (Nov/Dec 2011) (2 Marks)
4. Define - Super Quadrics (2 Marks)
5. What is blobby object? (2 Marks)
6. Write short notes on depth cueing. (2 Marks)
7. What is the use of control point? (2 Marks)
8. What are the different ways of specifying spline curve? (2 Marks)
9. What are the important properties of Bezier curve? (2 Marks)
10. Define – B-spline Curve (2 Marks)
11. What is particle system? (2 Marks)
12. Differentiate interpolation spline from approximation spline. (2 Marks)
13. Explain the 3D object representations. (May/June 2012) (16 Marks)
14. Determine the blending function for uniform periodic B-spline curve for $n=4$, $d=4$.
(May/June 2013) (8 Marks)
15. Write short notes on quadric surfaces. (Nov/Dec 2012) (8 Marks)
16. Describe the Bezier curves and surfaces. (May/June 2009, Apr/May 2008) (16 Marks)
17. Explain the various representation schemes and types of spline. (16 Marks)

3D Transformations

1. Explain the method to rotate an object about an axis that is not parallel to the coordinate axis with neat block diagram and derive the transformation matrix for the same. (May/June 2013) (16 Marks)
2. Explain the 3D transformations with suitable examples.
(Nov/Dec 2012, May/June 2012, Nov/Dec 2011, Nov/Dec 2009) (16 Marks)

Viewing

1. What is critical fusion frequency? (May/June 2013) (2 Marks)
2. What is viewing operation? (May/June 2012) (2 Marks)
3. Draw the three dimensional transformation pipeline. (2 Marks)
4. What is meant by view reference coordinate system? (2 Marks)
5. Write short notes on 3D viewing. (Nov/Dec 2012) (8 Marks)

Visible Surface Identification

1. List the classifications of visible surface detection algorithm. (2 Marks)
2. Explain the back face detection method. (May/June 2013) (8 Marks)
3. Explain the depth buffer method. (May/June 2013) (8 Marks)
4. Explain the area subdivision method. (8 Marks)
5. Explain the A-Buffer method. (8 Marks)

UNIT-III GRAPHICS PROGRAMMING

Color Models – RGB, YIQ, CMY, HSV

1. Draw the HLS color model. (May/June 2013) (2 Marks)
2. What is dithering? (May/June 2013) (2 Marks)
3. Distinguish between CMY and HSV color models. (Nov/Dec 2012) (2 Marks)
4. What are subtractive colors? (May/ June 2012) (2 Marks)

5. Write short notes on YIQ color model. (Apr/May 2008) (2 Marks)
6. Write the properties of light. (2 Marks)
7. Define – Chromaticity (2 Marks)
8. What is color model? (2 Marks)
9. Define – HSV Color Model (2 Marks)
10. List the features of XYZ color model. (2 Marks)
11. Write short notes on RGB color model. (2 Marks)
12. List the features of CMY color model. (2 Marks)
13. List the characteristics of HSV color model. (2 Marks)
14. Write the procedure to convert between HSV and RGB color model. (2 Marks)
15. What is the use of chromaticity diagram? (2 Marks)
16. Define – Complementary Colors (2 Marks)
17. What is color gamut? (2 Marks)
18. Write the conversion matrix of CMY to RGB representation. (2 Marks)
19. Write short notes on RGB and HSV color models. (Nov/Dec 2012, Nov/Dec 2011, May/June 2012, May/June 2013, Nov/Dec 2009, Apr/May 2008) (16 Marks)
20. Write short notes on the following:
 - a) YIQ Color Model (8 Marks)
 - b) CMY Color Model (8 Marks)

Animations – General Computer Animation, Raster, Keyframe

1. What is key frame? (Nov/Dec 2011, Nov/Dec 2012) (2 Marks)
2. What is meant by temporal aliasing? (May/ June 2012) (2 Marks)
3. What is animation? (Nov/Dec 2011, Apr/May 2010) (2 Marks)
4. List the animation softwares in use. (2 Marks)
5. Define – Morphing (2 Marks)
6. List the steps involved in designing an animation sequence. (2 Marks)
7. Describe the various computer animation techniques. (Nov/Dec 2012, Apr/May 2010, Nov/Dec 2009, May/June 2009, Apr/May 2008) (16 Marks)
8. What are key-frame systems? Explain. (16 Marks)
9. Describe the motion specification methods. (8 Marks)

Graphics Programming using OPENGL – Basic Graphics Primitives

1. Write the OPENGL command which is used to draw convex polygon. (2 Marks)
2. What is the command used in OPENGL to clear the screen? (2 Marks)
3. What are the various OPENGL data types? (2 Marks)
4. List the features of OPENGL. (2 Marks)
5. What is event-driven programming? (2 Marks)
6. List the basic graphics primitives. (2 Marks)
7. Write the command sequence in OPENGL to plot dots on screen. (2 Marks)
8. What is polyline? (2 Marks)
9. What is the function of gluLookAt ()? (2 Marks)
10. List the OpenGL tools used for modeling and viewing. (2 Marks)
11. Explain the basic OPENGL operations. (Nov/Dec 2011) (8 Marks)
12. Explain the various primitives and attributes in OPENGL. (8 Marks)

Drawing Three Dimensional Objects & Scenes

1. What is model view matrix? (2 Marks)
2. Define – SDL (2 Marks)
3. What is the role of projection matrix? (2 Marks)
4. State the role of viewport matrix. (2 Marks)
5. Explain the methods for drawing 3D objects and 3D scenes. (Nov/Dec 2012,

Nov/Dec 2011, May/June 2012, May/June 2013) (16 Marks)

6. Explain SDL with an example. **(8 Marks)**

UNIT-IV RENDERING

Introduction to Shading Models

1. What is shading? **(Nov/Dec 2011, May/June 2012) (2 Marks)**
2. What is diffuse reflectivity? **(2 Marks)**
3. Write the sequence of codes which are used to create light source in OpenGL. **(2 Marks)**
4. Write short notes on spotlights. **(2 Marks)**
5. Explain the various terms involved in shading. **(16 Marks)**

Flat and Smooth shading, Creating Shaded Objects

1. Differentiate flat shading from smooth shading. **(May/June 2013) (2 Marks)**
2. Define – Phong Model **(2 Marks)**
3. What is Gouraud shading? **(2 Marks)**
4. Explain the Gouraud shading technique. **(May/June 2013) (8 Marks)**
5. Differentiate flat shading from smooth shading models.
(Nov/Dec 2012, May/June 2012) (16 Marks)

Adding Texture to Faces

1. Define – Texture **(Nov/Dec 2011, Nov/Dec 2012, May/June 2012) (2 Marks)**
2. List the components of mesh objects. **(2 Marks)**
3. Explain the methods to add texture to faces. **(Nov/Dec 2011, May/June 2013) (16 Marks)**

Adding Shadows of Objects & Drawing shadows

1. List the ways of adding shadows to objects. **(Nov/Dec 2012) (2 Marks)**
2. Describe the methods to draw and add shadows of objects. **(Nov/Dec 2012, Nov/Dec 2011, May/June 2012, May/June 2013) (16 Marks)**

Building a Camera in a Program

1. List the ways to adjust a camera. **(2 Marks)**
2. Explain the concept of building camera in a program. **(Nov/Dec 2011, May/June 2013) (16 Marks)**

Rendering Texture

1. Define – Rendering **(May/June 2013, May/June 2009) (2 Marks)**
2. What is bump mapping? **(2 Marks)**
3. What is reflection mapping? **(2 Marks)**
4. What is meant by texture mapping? **(2 Marks)**

UNIT V – FRACTALS

Fractals and Self Similarity – Peano Curves

1. Define – Fractals **(Nov/Dec 2011, May/June 2012, May/June 2013) (2 Marks)**
2. List the properties of peano curves. **(Nov/Dec 2012) (2 Marks)**
3. What is fractal dimension? **(2 Marks)**
4. What is geometric fractal? **(2 Marks)**
5. What is Koch curve? **(2 Marks)**
6. List the properties of fractals. **(2 Marks)**
7. List the methods used to approach infinity. **(2 Marks)**
8. Write the pseudo code for drawing any order Koch curve. **(2 Marks)**
9. Write short notes on peano curves. **(May/June 2012, Nov/Dec 2011) (5 Marks)**
10. Describe the Koch curve. **(8 Marks)**

Creating Image by Iterated Functions

1. What is IFS? **(2 Marks)**
2. What is attractor? List the properties of it. **(2 Marks)**
3. What is chaos game? **(2 Marks)**

4. Write the pseudo code for playing the chaos game. (2 Marks)

Mandelbrot Sets & Julia Sets

1. Define – Mandelbrot Set (Nov/Dec 2011, May/June 2012) (2 Marks)
2. Define – Julia Set (Nov/Dec 2011, May/June 2012) (2 Marks)
3. What is filled-in Julia set? (2 Marks)
4. Write short notes on Mandelbrot sets and Julia sets. (May/June 2012, Nov/Dec 2012, May/June 2013) (16 Marks)

Random Fractals

1. What is random fractal? (2 Marks)
2. Describe the random fractals. (May/June 2012, Nov/Dec 2011) (8 Marks)

Overview of Ray Tracing –Intersecting Rays with Other Primitives

1. What is ray tracing? (2 Marks)
2. Write short notes on ray tracing. (May/June 2012, May/June 2013) (8 Marks)

Adding Surface Texture

1. What is surface patch? (May/June 2013) (2 Marks)
2. Explain the method for adding surface texture. (Nov/Dec 2012) (16 Marks)

Reflections and Transparency

1. Explain the concepts of reflection and transparency. (May/June 2012, May/June 2013) (8 Marks)

Boolean Operations on Objects

1. List the boolean operations on objects. (Nov/Dec 2012) (2 Marks)
2. State the data structure which is used to hold the boolean objects. (2 Marks)
3. Explain the CSG/ Boolean operations on objects. (May/June 2013) (8 Marks)