# Multiple Choice Questions & Answers

## 1. Which of the following is an application area of computer graphics?

a) Data processing

b) Text editing

c) Algorithm development

d) Video games

**Answer:** d) Video games

**Explanation:** Video games use computer graphics to create immersive visual experiences, utilizing techniques like rendering, animation, and shading to enhance gameplay.

## 2. What type of display system is used in most modern monitors?

a) Raster-scan

b) Random-scan

c) Direct-view

d) Projector-based

**Answer:** a) Raster-scan

**Explanation:** Most modern monitors use raster-scan systems, which display images by scanning lines from top to bottom, creating detailed and high-resolution graphics efficiently.

## 3. Which algorithm is used for drawing lines with an optimized use of integer arithmetic?

a) DDA

b) Bresenham's Algorithm

c) Euler's Method

d) Midpoint Circle Algorithm

**Answer:** b) Bresenham's Algorithm

**Explanation:** Bresenham's Algorithm is designed for drawing lines using integer arithmetic, optimizing performance by avoiding floating-point calculations and improving rendering speed.

**4. What does the scan-line polygon filling algorithm primarily use to determine the interior of a polygon?**

a) Boundary edges

b) Seed fill technique

c) Intersections of scan lines with polygon edges

d) Recursive division

**Answer:** c) Intersections of scan lines with polygon edges

**Explanation:** The scan-line polygon filling algorithm determines the interior of a polygon by identifying intersections of scan lines with the polygon's edges, filling the spans between pairs of intersections.

**5. Which polygon filling algorithm works by recursively filling surrounding pixels outward from a seed pixel?**

a) Scan-line

b) Boundary-fill

c) Flood-fill

d) Ray casting

**Answer:** c) Flood-fill

**Explanation:** The flood-fill algorithm starts from a seed pixel and recursively fills all surrounding pixels that are connected and share the same color or boundary condition, effectively covering the entire area.

## 6. In 2-D transformations, what is the purpose of homogeneous coordinates?

a) To simplify the representation of translation

b) To eliminate non-linear transformations

c) To reduce computational errors

d) To enhance color rendering

**Answer:** a) To simplify the representation of translation

**Explanation:** Homogeneous coordinates allow translation to be represented as matrix multiplication, unifying it with other linear transformations (like scaling and rotation) and simplifying the mathematical operations involved.

## 7. Which transformation does not change the size of an object?

a) Translation

b) Scaling

c) Rotation

d) Shear

**Answer:** c) Rotation

**Explanation:** Rotation transformation alters the orientation of an object but does not change its size, unlike scaling, translation, and shear transformations which can modify the dimensions of the object.

**8. The viewing pipeline in computer graphics involves:**

a) Only rendering the final image

b) Transforming objects based on camera perspective

c) Clipping and then projecting onto a view-port

d) Both b) and c)

**Answer:** d) Both b) and c)

**Explanation:** The viewing pipeline includes transforming objects based on camera perspective (b) and then clipping and projecting them onto a view-port (c), ensuring accurate representation and display of the scene.

**9. Which algorithm is specifically designed for line clipping?**

a) Liang-Barsky

b) Cohen-Sutherland

c) Sutherland-Hodgeman

d) Scan-line

**Answer:** b) Cohen-Sutherland

**Explanation:** The Cohen-Sutherland algorithm is specifically designed for line clipping, efficiently determining which portions of a line lie within a defined clip window.

## 10. What transformation is applied to adjust graphical objects into a specific portion of the screen, known as the viewport?

a) Scaling

b) Window-to-viewport transformation

c) Translation

d) Perspective projection

**Answer:** b) Window-to-viewport transformation

**Explanation:** The window-to-viewport transformation is applied to map coordinates from the logical coordinate system of the window into the physical coordinate system of the viewport, ensuring correct placement and sizing of graphical objects on the screen.

## 11. Which of the following best represents a use of quadric surfaces in computer graphics?

a) For creating flat surfaces

b) For simulating light reflections

c) For designing complex curved surfaces like spheres and cylinders

d) For texturing and coloring

**Answer:** c) For designing complex curved surfaces like spheres and cylinders

**Explanation:** Quadric surfaces are utilized in computer graphics to model complex curved shapes such as spheres and cylinders, providing a mathematically precise representation of these surfaces.

## 12. Bezier curves are widely used in computer graphics due to their:

a) Simple mathematical form

b) High processing speed

c) Ability to approximate complex shapes through control points

d) Low memory requirements

**Answer:** c) Ability to approximate complex shapes through control points

**Explanation:** Bezier curves are valued for their capacity to represent complex shapes accurately by manipulating control points, making them versatile tools for modeling intricate curves and surfaces in computer graphics.

## 13. Which type of spline is defined by control points that do not necessarily pass through the curve?

a) Hermite

b) Bézier

c) B-Spline

d) Linear

**Answer:** c) B-Spline

**Explanation:** B-Spline curves are defined by control points that do not necessarily lie on the curve itself, offering greater flexibility and control over the shape of the curve.

## 14. In 3-D object representation, what is primarily used to define smooth surfaces?

a) Polygons

b) Pixel arrays

c) Splines

d) Primitive solids

**Answer:** c) Splines

**Explanation:** Splines are primarily used in 3-D object representation to define smooth surfaces, offering flexibility and accuracy in modeling curved and complex shapes.

## 15. Which curve technique is especially effective for creating animations in graphic design due to its efficient handling of tangents and control points?

a) Hermite curve

b) Bezier curve

c) B-Spline

d) NURBS

**Answer:** a) Hermite curve

**Explanation:** Hermite curves are particularly effective for creating animations in graphic design because they allow precise control over tangents and control points, enabling smooth transitions and accurate motion paths.

## 16. Which device is used to input graphical data into the computer?

a) Scanner

b) Printer

c) Monitor

d) Speaker

**Answer:** a) Scanner

**Explanation:** A scanner is used to input graphical data into the computer by converting physical images or documents into digital format, allowing them to be processed and manipulated using software.

**17. What is the primary difference between raster-scan and random-scan systems in terms of image generation?**

a) Raster-scan systems use a grid of pixels, while random-scan systems draw images using vectors.

b) Random-scan systems can display color images, while raster-scan systems cannot.

c) Raster-scan systems are primarily used for static images, while random-scan systems are used for dynamic images.

d) Random-scan systems use less power than raster-scan systems.

**Answer:** a) Raster-scan systems use a grid of pixels, while random-scan systems draw images using vectors.

**Explanation:** Raster-scan systems generate images by scanning a grid of pixels, while random-scan systems draw images using vector-based techniques, which involve defining shapes and lines through mathematical equations rather than discrete pixels.

**18. Which algorithm is more efficient for drawing circles in terms of minimizing calculation overhead?**

a) Digital Differential Analyzer (DDA)

b) Bresenham's Algorithm

c) Midpoint Circle Algorithm

d) Euler's Method

**Answer:** c) Midpoint Circle Algorithm

**Explanation:** The Midpoint Circle Algorithm is more efficient for drawing circles as it minimizes calculation overhead by using integer arithmetic and avoids expensive trigonometric calculations, resulting in faster rendering of circle shapes.

## 19. Which output primitive forms the basis for all graphics rendering in computer graphics?

a) Polygons

b) Text

c) Points and lines

d) Bitmaps

**Answer:** c) Points and lines

**Explanation:** Points and lines form the fundamental output primitives in computer graphics, serving as the building blocks for rendering more complex shapes and images, including polygons and text.

## 20. What does the term 'ellipse-generating algorithms' refer to in computer graphics?

a) Algorithms that create oval shapes based on four control points.

b) Methods for drawing rounded rectangles.

c) Techniques for drawing ellipses based on center point, radii, and orientation.

d) Software tools for generating elliptical patterns in textile designs.

**Answer:** c) Techniques for drawing ellipses based on center point, radii, and orientation.

**Explanation:** Ellipse-generating algorithms in computer graphics refer to techniques for accurately drawing ellipses on the screen, typically defined by parameters such as the center point, radii, and orientation.

## 21. Matrix representations and homogeneous coordinates are crucial for:

a) Creating bitmaps

b) Text rendering

c) Performing geometric transformations

d) Clipping algorithms

**Answer:** c) Performing geometric transformations

**Explanation:** Matrix representations and homogeneous coordinates are essential for performing geometric transformations such as translation, rotation, scaling, and shearing in computer graphics, allowing efficient manipulation of objects in the scene.

## 22. Reflection transformation in 2D graphics involves:

a) Moving an object from one position to another

b) Changing the scale of an object

c) Mirroring an object across a specified axis

d) Rotating an object around a fixed point

**Answer:** c) Mirroring an object across a specified axis

**Explanation:** Reflection transformation in 2D graphics mirrors an object across a specified axis, creating a symmetrical reflection of the object's shape.

## 23. Shear transformation is used in 2D graphics to:

a) Rotate objects

b) Skew the shape of an object along one axis

c) Increase the size of an object uniformly

d) Translate an object in the xy-plane

**Answer:** b) Skew the shape of an object along one axis

**Explanation:** Shear transformation in 2D graphics distorts the shape of an object by shifting its points along one axis while keeping the other axis fixed, resulting in a skewed appearance.

## 24. Which of the following is a benefit of using composite transforms in graphics software?

a) Reducing the color depth required for images

b) Minimizing the computational resources for rendering

c) Simplifying multiple sequential transformations into a single operation

d) Enhancing the resolution of digital images

**Answer:** c) Simplifying multiple sequential transformations into a single operation

**Explanation:** Composite transforms allow multiple sequential transformations to be combined into a single operation, reducing computational complexity and simplifying the rendering process in graphics software.

## 25. The purpose of the viewing pipeline in 2D computer graphics is to:

a) Convert 3D scenes directly into a stereoscopic view

b) Manage the transformation of objects from model coordinates to screen coordinates

c) Process audiovisual data simultaneously

d) Enhance the color accuracy of digital prints

**Answer:** b) Manage the transformation of objects from model coordinates to screen coordinates

**Explanation:** The viewing pipeline in 2D computer graphics is responsible for managing the transformation of objects from their model coordinates to screen coordinates, ensuring correct positioning and rendering on the screen.

## 26. Polygon surfaces in 3D graphics are primarily used for:

a) Defining textures

b) Creating animations

c) Representing the outer shells of complex models

d) Simulating lighting effects

**Answer:** c) Representing the outer shells of complex models

**Explanation:** Polygon surfaces are commonly used in 3D graphics to represent the outer shells or surfaces of complex models, providing a straightforward and efficient method for defining the geometry of objects in a scene.

## 27. What distinguishes B-Spline curves from Bezier curves?

a) B-Spline curves offer more flexibility and control over the shape.

b) Bezier curves require less computational power to render.

c) B-Spline curves are only used in 3D modeling.

d) Bezier curves cannot be used to create smooth surfaces.

**Answer:** a) B-Spline curves offer more flexibility and control over the shape.

**Explanation:** B-Spline curves provide more flexibility and control over the shape compared to Bezier curves, allowing for smoother transitions and more intricate curves due to their local control property.

## 28. Which type of 3D object representation is ideal for creating smooth, free-flowing designs?

a) Polygonal meshes

b) Quadric surfaces

c) Splines

d) Voxel arrays

**Answer:** c) Splines

**Explanation:** Splines are ideal for creating smooth, free-flowing designs in 3D graphics due to their ability to define complex curves and surfaces with precise control over shape and continuity.

## 29. Which method is commonly used to fill polygons in computer graphics?

a) Seed fill

b) Scan-line algorithm

c) Recursive backtracking

d) Edge detection

**Answer:** b) Scan-line algorithm

**Explanation:** The scan-line algorithm is commonly used to fill polygons in computer graphics by traversing scan lines across the polygon's interior and determining which pixels to color based on intersections with the polygon edges.

## 30. What is the primary advantage of using homogeneous coordinates in graphics transformations?

a) They allow for easier integration of audio with visual data.

b) They support higher-resolution textures.

c) They facilitate the inclusion of translation within matrix operations.

d) They reduce the processing power needed for rendering 3D images.

**Answer:** c) They facilitate the inclusion of translation within matrix operations.

**Explanation:** Homogeneous coordinates simplify the representation of translation transformations within matrix operations, making it easier to combine translation with other transformations like rotation and scaling in a unified mathematical framework.

## 31. Which clipping algorithm is particularly useful for polygons?

a) Liang-Barsky

b) Cohen-Sutherland

c) Sutherland-Hodgeman

d) Midpoint

**Answer:** c) Sutherland-Hodgeman

**Explanation:** The Sutherland-Hodgeman algorithm is particularly useful for clipping polygons, as it efficiently determines the intersection points of the polygon edges with the clipping window and generates the clipped polygon by processing these intersections.

## 32. In computer graphics, what is the primary purpose of the Cohen-Sutherland algorithm?

a) To clip text for readability

b) To clip lines to a specified rectangular area

c) To transform 3D objects into 2D images

d) To apply textures to 3D models

**Answer:** b) To clip lines to a specified rectangular area

**Explanation:** The primary purpose of the Cohen-Sutherland algorithm is to clip lines to a specified rectangular area or viewport, efficiently determining which portions of a line lie inside or outside the clipping window.

## 33. Which of the following is used to create complex natural shapes like terrains or clouds in computer graphics?

a) Vector graphics

b) Bitmaps

c) Fractal algorithms

d) Line-drawing algorithms

**Answer:** c) Fractal algorithms

**Explanation:** Fractal algorithms are used to generate complex natural shapes like terrains or clouds in computer graphics by recursively applying mathematical functions or procedures, resulting in self-similar patterns at different scales.

## 34. What is the main advantage of using Bresenham's line algorithm over DDA?

a) It requires more memory.

b) It is less accurate.

c) It is faster because it uses integer arithmetic.

d) It only works with horizontal lines.

**Answer:** c) It is faster because it uses integer arithmetic.

**Explanation:** The main advantage of Bresenham's line algorithm over DDA (Digital Differential Analyzer) is that it is faster due to its use of integer arithmetic, which avoids the need for floating-point calculations and results in more efficient line rendering.

## 35. In the context of 3D graphics, what are quadric surfaces used for?

a) Creating flat, two-dimensional shapes

b) Simulating complex light interactions

c) Modeling simple geometric shapes like spheres and cylinders

d) Implementing collision detection

**Answer:** c) Modeling simple geometric shapes like spheres and cylinders

**Explanation:** Quadric surfaces are a class of surfaces described by quadratic equations. They are used in 3D graphics for modeling simple geometric shapes like spheres, ellipsoids, cylinders, and cones, which have curved surfaces that can be efficiently represented using quadratic equations.

## 36. What type of transformation is used to change the position of an object without altering its shape?

a) Scaling

b) Translation

c) Rotation

d) Shearing

**Answer:** b) Translation

**Explanation:** Translation is the geometric transformation that changes the position of an object in space without altering its shape, size, or orientation. It involves shifting the object by a specific vector distance along the x, y, and z axes.

## 37. Which of the following best describes anti-aliasing?

a) A technique to enhance model complexity

b) A method to add textures to surfaces

c) A process to smooth out jagged edges in digital images

d) A strategy to reduce the polygon count in models

**Answer:** c) A process to smooth out jagged edges in digital images

**Explanation:** Anti-aliasing is a technique used in computer graphics to smooth out jagged edges and stair-stepping artifacts that can occur when rendering curved or diagonal lines on a raster display. It works by blending the colors of adjacent pixels to create a smoother, more realistic appearance.

## 38. Bezier curves are particularly useful for:

a) Text rendering in web design

b) Creating realistic shadow effects

c) Graphic design and animation for controlling shape

d) 3D printing processes

**Answer:** c) Graphic design and animation for controlling shape

**Explanation:** Bezier curves are widely used in graphic design and animation for creating and controlling the shape of curves and objects. They provide a mathematically precise way to define smooth, flowing curves using control points, making them highly versatile for shaping and manipulating objects in digital art and animation.

## 39. What does a spline represent in computer graphics?

a) A specific type of texture mapping

b) A method for drawing straight lines

c) A flexible curve controlled by multiple points

d) A shading technique

**Answer:** c) A flexible curve controlled by multiple points

**Explanation:** In computer graphics, a spline is a mathematical representation of a flexible curve that is controlled by multiple points or control vertices. The curve smoothly interpolates or approximates these points.

## 40. In which scenario would you most likely use the flood-fill algorithm?

a) When drawing a rectangle in a paint program

b) To fill an enclosed area with color in a graphic design software

c) For creating shadows in a video game

d) When modeling a 3D object

**Answer:** b) To fill an enclosed area with color in a graphic design software

**Explanation:** The flood-fill algorithm is commonly used in graphic design software to fill an enclosed area with a specific color or pattern automatically.

## 41. What role does the graphics pipeline play in computer graphics?

a) It speeds up the processing of audio signals.

b) It manages the sequential processing of rendering 3D scenes into 2D images.

c) It reduces the file size of images for faster loading.

d) It converts text into graphical format.

**Answer:** b) It manages the sequential processing of rendering 3D scenes into 2D images.

**Explanation:** The graphics pipeline is a series of steps that manage the sequential processing required to render 3D scenes into 2D images for display on a screen.

## 42. Which is an example of a non-uniform transformation?

a) Translation moving an object 10 units to the right

b) Scaling an object to twice its size in the x-axis only

c) Rotating an object by 45 degrees

d) Mirroring an object across the y-axis

**Answer:** b) Scaling an object to twice its size in the x-axis only

**Explanation:** Scaling an object to a different size along different axes is an example of a non-uniform transformation, as it changes the object's shape and proportions.

## 43. Hermite curves are used in graphics for:

a) Creating encrypted text

b) Developing collision physics

c) Modeling smooth curved surfaces

d) Generating random textures

**Answer:** c) Modeling smooth curved surfaces

**Explanation:** Hermite curves are used in computer graphics for modeling smooth curved surfaces, as they provide a way to define curves with specific tangent vectors at the endpoints.

## 44. What characteristic of the Midpoint Circle Algorithm makes it efficient?

a) It calculates positions using a form of differential equations.

b) It utilizes floating-point arithmetic for precision.

c) It leverages symmetry, reducing the number of calculations needed.

d) It uses external hardware to speed up calculations.

**Answer:** c) It leverages symmetry, reducing the number of calculations needed.

**Explanation:** The Midpoint Circle Algorithm is efficient because it leverages the symmetry of circles, allowing it to calculate only one-eighth of the circle's points and derive the rest through symmetry.

## 45. Why is window-to-viewport transformation important in computer graphics?

a) It helps in converting sound waves to digital format.

b) It scales down the graphical output to fit the screen size.

c) It translates 3D models into a standard viewing format.

d) It ensures that graphical content is appropriately mapped to the display area.

**Answer:** d) It ensures that graphical content is appropriately mapped to the display area.

**Explanation:** The window-to-viewport transformation is crucial in computer graphics as it maps the logical coordinates of a scene or image to the physical coordinates of the display area or viewport.

## 46. Which type of input device is commonly used to interact with graphical applications?

a) Microphone

b) Keyboard and mouse

c) Webcam

d) Printer

**Answer:** b) Keyboard and mouse

**Explanation:** The keyboard and mouse are the most common input devices used to interact with graphical applications, allowing users to provide text input, navigate menus, and manipulate graphical elements.

## 47. What is the primary function of a graphics monitor?

a) To output audio signals synchronized with visual data

b) To display graphical outputs from a computer

c) To store graphical data for long-term retrieval

d) To enhance the graphical processing power of a computer

**Answer:** b) To display graphical outputs from a computer

**Explanation:** The primary function of a graphics monitor is to display the graphical outputs generated by a computer, such as user interfaces, images, videos, and 3D renderings.

## 48. Which line drawing algorithm is preferable for creating a line with a steep slope on pixel-based devices?

a) Digital Differential Analyzer (DDA)

b) Bresenham's line algorithm

c) Midpoint algorithm

d) Scan conversion algorithm

**Answer:** b) Bresenham's line algorithm

**Explanation:** Bresenham's line algorithm is preferable for creating lines with steep slopes on pixel-based devices because it uses integer arithmetic and is optimized for drawing lines with steep slopes efficiently.

## 49. Circle-generating algorithms in computer graphics are used to:

a) Decrease rendering time for complex shapes

b) Create perfect circles by calculating all possible points

c) Approximate circle shapes by calculating key points and using symmetry

d) Generate random points within a circular area

**Answer:** c) Approximate circle shapes by calculating key points and using symmetry

**Explanation:** Circle-generating algorithms, such as the Midpoint Circle Algorithm, approximate circle shapes by calculating key points and leveraging the symmetry of circles to derive the remaining points efficiently.

## 50. Boundary-fill algorithm is best used in situations where:

a) The boundary of the area to be filled is well-defined by a single color.

b) The filling process needs to be applied to non-rectangular areas.

c) Large areas of the screen are to be filled, and performance is a concern.

d) The area to be filled is surrounded by multiple colors.

**Answer:** a) The boundary of the area to be filled is well-defined by a single color.

**Explanation:** The boundary-fill algorithm is best used when the boundary of the area to be filled is clearly defined by a single color, as it relies on identifying the boundary color to determine the region to be filled.

## 51. Which transformation involves changing the size of an object in a 2D space?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** b) Scaling

**Explanation:** Scaling transformation alters the size of an object in a 2D space by multiplying its coordinates by scaling factors along the x and y axes.

## 52. The process of converting the coordinates of a graphical object from one system to another is known as:

a) Clipping

b) Mapping

c) Transformation

d) Rendering

**Answer:** c) Transformation

**Explanation:** Transformation involves converting the coordinates of a graphical object from one coordinate system to another, typically to facilitate rendering or manipulation in computer graphics.

**53. Which of the following is true about homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations.

b) They are only used in 3D graphics.

c) They eliminate the need for matrices.

d) They are less accurate than Cartesian coordinates.

**Answer:** a) They simplify calculations involving translations.

**Explanation:** Homogeneous coordinates simplify calculations involving translations by allowing them to be represented as matrix multiplications, which streamlines the transformation process in computer graphics.

**54. Which of the following operations would be used to remove portions of graphics that are outside the viewing area?**

a) Clipping

b) Masking

c) Culling

d) Filtering

**Answer:** a) Clipping

**Explanation:** Clipping is the operation used to remove portions of graphics that fall outside the viewing area, ensuring that only the visible parts of the graphics are rendered on the screen.

**55. In graphics, the viewing pipeline is crucial because it:**

a) Enhances the resolution of the final image.

b) Determines the color palette used in images.

c) Manages the process by which 3D scenes are converted to 2D images.

d) Controls the hardware used in rendering images.

**Answer:** c) Manages the process by which 3D scenes are converted to 2D images.

**Explanation:** The viewing pipeline orchestrates the transformation of 3D scenes into 2D images, ensuring proper rendering and display on the screen or other output devices.

## 56. The Cohen-Sutherland algorithm is used for:

a) Clipping polygons

b) Clipping lines

c) Rendering bezier curves

d) Applying textures to 3D models

**Answer:** b) Clipping lines

**Explanation:** The Cohen-Sutherland algorithm is primarily used for clipping lines to a specified rectangular area or viewport, efficiently determining which portions of a line lie inside or outside the clipping window.

## 57. A key feature of the Sutherland-Hodgeman algorithm is that it is used for:

a) Line clipping in a three-dimensional space

b) Clipping polygons against a rectangular clipping window

c) Generating fractal images

d) Texturing in animations

**Answer:** b) Clipping polygons against a rectangular clipping window

**Explanation:** The Sutherland-Hodgeman algorithm is specifically designed for clipping polygons against a rectangular clipping window, efficiently determining the intersections of polygon edges with the window boundaries to generate the clipped polygon.

### 58. What advantage do splines provide in the creation of graphics?

a) They offer a standardized method for color correction.

b) They allow for efficient data compression of image files.

c) They provide a means to create smooth and scalable curves.

d) They are used to enhance the depth perception in virtual environments.

**Answer:** c) They provide a means to create smooth and scalable curves.

**Explanation:** Splines offer a means to create smooth and scalable curves in graphics, providing flexibility and precision in defining complex shapes and curves.

### 59. Bezier and B-Spline curves are extensively used in computer graphics due to their:

a) Ability to represent complex logarithmic relationships

b) Capability to facilitate real-time rendering

c) Flexibility in designing curves and controlling their shape

d) Efficiency in processing audiovisual data

**Answer:** c) Flexibility in designing curves and controlling their shape

**Explanation:** Bezier and B-Spline curves offer flexibility in designing curves and controlling their shape, allowing for precise manipulation and representation of complex shapes and curves in computer graphics applications.

**60. The primary use of quadric surfaces in computer graphics is to:**

a) Create complex texture mappings

b) Model basic geometric forms like spheres and cylinders

c) Perform advanced animations

d) Implement physics engines

**Answer:** b) Model basic geometric forms like spheres and cylinders

**Explanation:** Quadric surfaces are commonly used in computer graphics to model basic geometric forms such as spheres, cylinders, cones, and ellipsoids, providing a convenient representation for these shapes in 3D environments.

**61. Which of the following best describes the function of a graphics tablet in computer graphics?**

a) It is used primarily for 3D modeling.

b) It serves as an input device for drawing and object manipulation.

c) It processes graphic data to render images faster.

d) It displays high-resolution versions of graphical outputs.

**Answer:** b) It serves as an input device for drawing and object manipulation.

**Explanation:** A graphics tablet functions as an input device for drawing and object manipulation in computer graphics, providing a digital interface for users to create or modify graphical content using a stylus or pen-like tool.

**62. The Midpoint Circle Algorithm is used to draw circles in computer graphics. What is its primary advantage?**

a) It allows for direct manipulation of the circle's radius in real-time.

b) It ensures perfect circles by using floating-point arithmetic.

c) It reduces computational effort by exploiting the symmetry of circles.

d) It generates circles by layering multiple small polygons.

**Answer:** c) It reduces computational effort by exploiting the symmetry of circles.

**Explanation:** The primary advantage of the Midpoint Circle Algorithm is that it reduces computational effort by exploiting the symmetry of circles, resulting in faster and more efficient circle drawing compared to other methods.

## 63. What is the primary purpose of the window-to-viewport coordinate transformation in computer graphics?

a) To optimize the rendering of textures.

b) To map a portion of a 2D world onto the display area.

c) To convert 3D models into 2D images.

d) To increase the resolution of digital images.

**Answer:** b) To map a portion of a 2D world onto the display area.

**Explanation:** The primary purpose of the window-to-viewport coordinate transformation is to map a portion of a 2D world, defined by a window in the user coordinate system, onto the display area or viewport, ensuring correct positioning and rendering of objects on the screen.

## 64. In the context of 2D viewing, what is 'clipping'?

a) A method to enhance the color depth of images.

b) The process of modifying object data for storage.

c) The process of selecting which part of a scene to render.

d) A technique for combining multiple images into one.

**Answer:** c) The process of selecting which part of a scene to render.

**Explanation:** Clipping in the context of 2D viewing refers to the process of selecting which part of a scene, such as lines, polygons, or other graphical primitives, to render, discarding or modifying portions that fall outside the viewable area or clipping window.

## 65. Which algorithm would you use for filling a given area with a specified color in a graphic application?

a) Cohen-Sutherland

b) Boundary-fill

c) DDA

d) Bresenham's line

**Answer:** b) Boundary-fill

**Explanation:** Boundary-fill algorithm is specifically designed for filling a given area with a specified color in a graphic application by selecting a seed point and filling adjacent pixels until a boundary color is encountered.

## 66. In computer graphics, what are homogeneous coordinates most commonly used for?

a) Improving the color accuracy of images.

b) Enabling easier transformations, such as translation.

c) Reducing the rendering time of animations.

d) Increasing the resolution of rendered images.

**Answer:** b) Enabling easier transformations, such as translation.

**Explanation:** Homogeneous coordinates are primarily used in computer graphics to simplify geometric transformations, such as translation, rotation,

scaling, and shearing, by representing them as matrix operations, thus facilitating easier manipulation and transformation of objects.

## 67. Which of the following best describes the role of the viewing pipeline in 3D computer graphics?

a) It converts text data into graphical formats.

b) It sequences the process of converting 3D scenes to 2D images through stages like transformation and clipping.

c) It is responsible for audio synchronization in animations.

d) It compresses graphical data for efficient storage.

**Answer:** b) It sequences the process of converting 3D scenes to 2D images through stages like transformation and clipping.

**Explanation:** The viewing pipeline in 3D computer graphics manages the sequence of operations involved in converting 3D scenes into 2D images for display, including transformations, clipping, and other stages necessary for rendering scenes accurately on a 2D screen.

## 68. What is a key advantage of using B-Spline curves in graphic design?

a) They provide a precise method for text rendering.

b) They allow greater control over curve smoothness and shape flexibility.

c) They simplify the color grading process.

d) They are easier to render than lines and circles.

**Answer:** b) They allow greater control over curve smoothness and shape flexibility.

**Explanation:** B-Spline curves offer greater control over curve smoothness and shape flexibility in graphic design, allowing designers to create and manipulate curves with precision and versatility.

**69. Which feature makes the Hermite curve especially useful in animations and graphic design?**

a) Its ability to encrypt sensitive image data.

b) The control it provides over the curve's tangents and endpoints.

c) Its capacity to automatically generate 3D textures.

d) Its use in optimizing graphical user interface layouts.

**Answer:** b) The control it provides over the curve's tangents and endpoints.

**Explanation:** The Hermite curve is especially useful in animations and graphic design because it allows precise control over the curve's tangents and endpoints, enabling smooth transitions and precise adjustments in animations and design elements.

**70. The process of adding a surface texture to a 3D model in graphics is known as:**

a) Clipping

b) Rasterizing

c) Texturing

d) Masking

**Answer**: c) Texturing

**Explanation:** Texturing involves applying surface textures or patterns to 3D models to enhance their visual appearance and realism in computer graphics.

**71. What function does the Sutherland-Hodgeman algorithm serve in computer graphics?**

a) It is used for encrypting graphic data.

b) It is a text rendering algorithm.

c) It clips polygons to fit within a specified boundary.

d) It assists in direct manipulation of 3D models.

**Answer**: c) It clips polygons to fit within a specified boundary.

**Explanation:** The Sutherland-Hodgeman algorithm is primarily used for clipping polygons against a specified boundary or window, ensuring that only the visible portions of the polygon are retained for rendering.

## 72. When is anti-aliasing particularly useful in digital image processing?

a) When compressing image files.

b) When enhancing the depth of 3D models.

c) When smoothing out jagged edges in images.

d) When converting images from one file format to another.

**Answer**: c) When smoothing out jagged edges in images.

**Explanation:** Anti-aliasing is particularly useful in digital image processing when smoothing out jagged edges or reducing aliasing artifacts, resulting in a more visually pleasing and smoother appearance of images, especially in scenarios where sharp edges may appear pixelated or jagged.

## 73. What is the primary challenge when rendering 3-D images on 2-D displays?

a) Encrypting the data to prevent unauthorized copying.

b) Simulating depth and perspective correctly.

c) Converting the image color from RGB to CMYK.

d) Increasing the frame rate of animations.

**Answer**: b) Simulating depth and perspective correctly.

**Explanation:** The primary challenge when rendering 3-D images on 2-D displays is simulating depth and perspective correctly to create the illusion of three-dimensional space on a two-dimensional screen, ensuring that objects appear realistic and accurately positioned relative to each other.

## 74. In computer graphics, what is a 'pixel'?

a) A unit of color depth in an image.

b) A method for compressing graphical data.

c) The smallest controllable element of a picture represented on the screen.

d) A type of vector used in 3D modeling.

**Answer**: c) The smallest controllable element of a picture represented on the screen.

**Explanation:** A pixel is the smallest controllable element of a picture represented on the screen in computer graphics. It is a single point in a graphic image, and the combination of multiple pixels forms the visual content displayed on a screen.

## 75. What does the term 'raster graphics' refer to?

a) A technique for creating 3D models.

b) Graphics where images are stored in pixel arrays.

c) A method for clipping lines and shapes in a viewport.

d) The process of converting vector graphics to a standard image format.

**Answer**: b) Graphics where images are stored in pixel arrays.

**Explanation:** Raster graphics refer to graphics where images are stored and displayed as a grid of pixels, with each pixel containing color information, enabling the representation of complex images by arranging pixels in a two-dimensional array.

## 76. Which algorithm is commonly used for line clipping in computer graphics?

a) Midpoint circle algorithm

b) Flood-fill algorithm

c) Cohen-Sutherland algorithm

d) Bresenham's line algorithm

**Answer**: c) Cohen-Sutherland algorithm

**Explanation:** The Cohen-Sutherland algorithm is commonly used for line clipping in computer graphics. It efficiently clips lines against a rectangular clipping window by determining which portions of the lines lie within the window boundaries.

## 77. What is the primary function of the flood-fill algorithm in computer graphics?

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer**: c) Filling closed areas with color

**Explanation:** The primary function of the flood-fill algorithm in computer graphics is to fill closed areas with a specified color. This algorithm starts from

a seed point and spreads outwards, filling all connected pixels that meet the criteria until the boundary of the area is reached.

## 78. In computer graphics, what is the primary purpose of the viewing coordinate reference frame?

a) To define the perspective of the viewer

b) To store texture data

c) To represent the object's position in 3D space

d) To map object coordinates to screen coordinates

**Answer**: a) To define the perspective of the viewer

**Explanation:** The viewing coordinate reference frame in computer graphics is primarily used to define the perspective of the viewer. It establishes the viewpoint, orientation, and direction of viewing, which are crucial for rendering the scene correctly from the viewer's perspective.

## 79. Which of the following transformations changes the orientation of an object?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer**: c) Rotation

**Explanation:** Rotation is the transformation that changes the orientation of an object by turning it around a specified axis or point. This alters the angular position of the object while keeping its size and shape intact.

**80. Which transformation is used to change the size of an object in computer graphics?**

a) Translation

b) Scaling

c) Reflection

d) Shearing

**Answer:** b) Scaling

**Explanation:** Scaling is the transformation that changes the size of an object. It involves enlarging or reducing the dimensions of the object by multiplying the coordinates of each point by a scaling factor.

**81. What is the primary advantage of using homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify calculations involving translations by allowing translation transformations to be represented as matrix multiplications. This unifies the representation of various transformations, making it easier to combine them.

**82. Which operation is responsible for converting 3D objects into 2D images in computer graphics?**

a) Translation

b) Projection

c) Clipping

d) Scaling

**Answer**: b) Projection

**Explanation:** Projection is the operation that transforms 3D objects into 2D images by mapping points from the three-dimensional space onto a two-dimensional plane, which is essential for displaying 3D models on 2D screens.

## 83. Which algorithm is specifically designed for clipping lines against a rectangular window in computer graphics?

a) Bresenham's line algorithm

b) Cohen-Sutherland algorithm

c) Midpoint circle algorithm

d) Flood-fill algorithm

**Answer**: b) Cohen-Sutherland algorithm

**Explanation:** The Cohen-Sutherland algorithm is specifically designed for line clipping against a rectangular window. It uses a divide-and-conquer approach to determine the portions of a line that are inside or outside the rectangular clipping boundary.

## 84. Which type of transformation is used to change the position of an object in computer graphics?

a) Scaling

b) Translation

c) Rotation

d) Shearing

**Answer**: b) Translation

**Explanation:** Translation is a type of transformation used to change the position of an object in computer graphics by moving it from one location to another without altering its shape, size, or orientation.

## 85. What is the primary function of the viewing pipeline in computer graphics?

a) To convert audio signals into visual data

b) To manage transformations between different coordinate systems

c) To enhance image resolution

d) To convert 3D scenes into 2D images

**Answer**: d) To convert 3D scenes into 2D images

**Explanation:** The viewing pipeline in computer graphics is responsible for converting 3D scenes into 2D images through a series of transformations, including model transformations, viewing transformations, and projection transformations. This process ensures that 3D objects are correctly displayed on a 2D screen.

## 86. Which curve representation allows for precise control over the shape of a curve using control points?

a) Bézier curve

b) Hermite curve

c) B-Spline curve

d) Elliptic curve

**Answer**: a) Bézier curve

**Explanation:** Bézier curves allow for precise control over the shape of the curve using control points. By adjusting these control points, designers can manipulate the curvature and the overall shape of the curve, making Bézier curves a popular choice in computer graphics and design.

## 87. In computer graphics, what is the primary function of quadric surfaces?

a) To represent curves in 3D space

b) To model complex organic shapes

c) To simulate lighting effects

d) To model basic geometric shapes like spheres and cylinders

**Answer**: d) To model basic geometric shapes like spheres and cylinders

**Explanation:** The boundary-fill algorithm iterates through neighboring pixels of a seed point, filling them with the specified color until it reaches the boundary of the closed area. It's particularly useful for tasks like coloring shapes and filling regions in digital painting and image editing applications.

## 88. What is the primary purpose of the boundary-fill algorithm in computer graphics?

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer**: c) Filling closed areas with color

**Explanation:** The boundary-fill algorithm in computer graphics is primarily used to fill closed areas with a specified color. It works by starting from a seed point within the closed region and recursively fills neighboring pixels until it

encounters the boundary of the region. This algorithm is commonly employed for tasks such as coloring shapes and filling regions in digital painting and image editing software.

## 89. Which of the following transformations does not change the size of an object?

a) Translation

b) Scaling

c) Rotation

d) Reflection

**Answer**: a) Translation

**Explanation:** Translation involves moving an object from one position to another in a coordinate system without altering its size, shape, or orientation. Unlike scaling, rotation, and reflection, translation solely affects the position of the object along the coordinate axes, making it the transformation that does not change the size of the object.

## 90. What is the primary role of the Sutherland-Hodgeman algorithm in computer graphics?

a) Clipping lines

b) Clipping polygons

c) Transforming vertices

d) Generating fractal images

**Answer**: b) Clipping polygons

**Explanation:** Translation involves moving an object from one position to another in a coordinate system without altering its size, shape, or orientation. Unlike scaling, rotation, and reflection, translation solely affects the position of

the object along the coordinate axes, making it the transformation that does not change the size of the object.

## 91. In 2D graphics, which transformation changes the shape of an object by slanting it along an axis?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer**: d) Shearing

**Explanation:** Shearing transformation in 2D graphics alters the shape of an object by slanting or skewing it along one of the coordinate axes. This transformation modifies the position of each point in an object along the specified axis, resulting in a transformed shape that is sheared or distorted relative to its original orientation. Shearing is commonly used in various applications, such as creating visual effects, text formatting, and perspective projections.

## 92. What is the primary advantage of using composite transforms in computer graphics?

a) They simplify the representation of objects

b) They reduce memory usage

c) They combine multiple transformations into a single operation

d) They improve rendering speed

**Answer**: c) They combine multiple transformations into a single operation

**Explanation:** Composite transforms streamline the application of multiple transformations, reducing computational overhead and enhancing efficiency in rendering complex graphics scenes.

## 93. Which algorithm is commonly used for filling polygons in computer graphics?

a) DDA

b) Bresenham's line algorithm

c) Flood-fill

d) Midpoint circle algorithm

**Answer**: c) Flood-fill

**Explanation:** Flood-fill algorithm is widely employed for filling closed areas with color in computer graphics, efficiently handling interior region coloring tasks within polygons.

## 94. Which type of transformation changes the orientation of an object in computer graphics?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer**: c) Rotation

**Explanation:** Rotation transformation alters the orientation of an object around a fixed point or axis in computer graphics, enabling the manipulation of its spatial orientation.

**95. What is the primary function of the window-to-viewport transformation in computer graphics?**

a) To optimize the rendering process

b) To convert 3D scenes into 2D images

c) To map a portion of the world onto the display area

d) To manage transformations between different coordinate systems

**Answer**: c) To map a portion of the world onto the display area

**Explanation:** The window-to-viewport transformation maps a portion of the 2D world space defined in window coordinates to the display area of the screen, ensuring proper visualization of the scene.

**96. Which of the following is true about homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer**: a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify operations such as translation by representing points in a higher-dimensional space, enabling easier integration of translation within matrix transformations.

**97. What is the primary purpose of the viewing pipeline in computer graphics?**

a) To convert audio signals into visual data

b) To manage transformations between different coordinate systems

c) To enhance image resolution

d) To convert 3D scenes into 2D images

**Answer**: d) To convert 3D scenes into 2D images

**Explanation:** The viewing pipeline is responsible for processing 3D scenes, applying transformations like projection and clipping, to ultimately generate 2D images for display on a screen.

## 98. Which algorithm is specifically designed for clipping lines against a rectangular window in computer graphics?

a) Bresenham's line algorithm

b) Cohen-Sutherland algorithm

c) Midpoint circle algorithm

d) Flood-fill algorithm

**Answer**: b) Cohen-Sutherland algorithm

**Explanation:** The Cohen-Sutherland algorithm is primarily used for line clipping against a rectangular window in computer graphics, efficiently determining which parts of lines lie inside the specified region.

## 99. What is the primary function of the flood-fill algorithm in computer graphics?

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer**: c) Filling closed areas with color

**Explanation:** The flood-fill algorithm is primarily used to fill closed areas with a specified color in computer graphics, efficiently coloring regions bounded by lines or curves.

## 100. In computer graphics, what is the primary purpose of the viewing coordinate reference frame?

a) To define the perspective of the viewer

b) To store texture data

c) To represent the object's position in 3D space

d) To map object coordinates to screen coordinates

**Answer**: a) To define the perspective of the viewer

**Explanation:** The viewing coordinate reference frame is crucial for defining the perspective from which a scene or object is observed, ensuring accurate rendering of the visual content for the viewer.

## 101. Which transformation is used to change the size of an object in computer graphics?

a) Translation

b) Scaling

c) Reflection

d) Shearing

**Answer**: b) Scaling

**Explanation:** Scaling transformation alters the size of an object by stretching or compressing it along one or more axes, thereby changing its dimensions while maintaining its shape.

**102. Which of the following transformations changes the orientation of an object?**

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer**: c) Rotation

**Explanation:** Rotation transformation rotates an object around a fixed point, changing its orientation relative to the coordinate axes or another reference point.

**103. What is the primary advantage of using homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer**: a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates facilitate translation operations by allowing them to be represented as matrix multiplications, simplifying the transformation process in computer graphics.

**104. What is the primary role of the Sutherland-Hodgeman algorithm in computer graphics?**

a) Clipping lines

b) Clipping polygons

c) Transforming vertices

d) Generating fractal images

**Answer**: b) Clipping polygons

**Explanation:** The Sutherland-Hodgeman algorithm is specifically designed to clip polygons against a rectangular clipping window in computer graphics, ensuring only the visible parts of polygons are rendered.

## 105. In 2D graphics, which transformation changes the shape of an object by slanting it along an axis?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer**: d) Shearing

**Explanation:** Shearing transformation in 2D graphics involves changing the shape of an object by slanting it along an axis, distorting its appearance. This transformation is commonly used to create various visual effects and transformations in computer graphics.

## 106. Which algorithm is commonly used for filling polygons in computer graphics?

a) DDA

b) Bresenham's line algorithm

c) Flood-fill

d) Midpoint circle algorithm

**Answer**: c) Flood-fill

**Explanation:** Flood-fill algorithm is commonly used for filling polygons in computer graphics. It efficiently fills closed areas with a specified color by starting from a given point and flooding outward until it encounters a boundary.

## 107. What is the primary advantage of using composite transforms in computer graphics?

a) They simplify the representation of objects

b) They reduce memory usage

c) They combine multiple transformations into a single operation

d) They improve rendering speed

**Answer**: c) They combine multiple transformations into a single operation

**Explanation:** Composite transforms allow multiple sequential transformations to be combined into a single operation, reducing computational overhead and simplifying the rendering process.

## 108. Which of the following is true about homogeneous coordinates in computer graphics?

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer**: a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify transformations by allowing translation operations to be represented as matrix multiplications, facilitating easier manipulation of object positions in 2D and 3D space.

**109. What is the primary function of the window-to-viewport transformation in computer graphics?**

a) To optimize the rendering process

b) To convert 3D scenes into 2D images

c) To map a portion of the world onto the display area

d) To manage transformations between different coordinate systems

**Answer**: c) To map a portion of the world onto the display area

**Explanation:** The window-to-viewport transformation is responsible for mapping a specified portion of the world coordinate system onto the display area, determining which part of the scene will be visible on the screen.

**110. Which algorithm is specifically designed for clipping lines against a rectangular window in computer graphics?**

a) Bresenham's line algorithm

b) Cohen-Sutherland algorithm

c) Midpoint circle algorithm

d) Flood-fill algorithm

**Answer**: b) Cohen-Sutherland algorithm

**Explanation:** The Cohen-Sutherland algorithm is primarily used for line clipping against a rectangular window in computer graphics, efficiently determining which parts of the lines lie inside the defined clipping region.

**111. What is the primary function of the flood-fill algorithm in computer graphics?**

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer**: c) Filling closed areas with color

**Explanation:** The flood-fill algorithm is commonly used to fill closed areas with color in computer graphics, starting from a seed point and coloring adjacent pixels until the boundary is reached.

**112. In computer graphics, what is the primary purpose of the viewing coordinate reference frame?**

a) To define the perspective of the viewer

b) To store texture data

c) To represent the object's position in 3D space

d) To map object coordinates to screen coordinates

**Answer**: a) To define the perspective of the viewer

**Explanation:** The viewing coordinate reference frame establishes the perspective from which a scene or object is viewed, determining how it appears on the screen or in the rendered image.

**113. Which transformation is used to change the size of an object in computer graphics?**

a) Translation

b) Scaling

c) Reflection

d) Shearing

**Answer**: b) Scaling

**Explanation:** Scaling transformation alters the size of an object in computer graphics, making it larger or smaller along one or more axes while preserving its shape and orientation.

## 114. Which of the following transformations changes the orientation of an object?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** c) Rotation

**Explanation:** Rotation transformation alters the orientation of an object in computer graphics, causing it to rotate around a specified point or axis.

## 115. What is the primary advantage of using homogeneous coordinates in computer graphics?

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify calculations involving translations by allowing them to be represented as matrix multiplications, making transformations more efficient.

## 116. What is the primary role of the Sutherland-Hodgeman algorithm in computer graphics?

a) Clipping lines

b) Clipping polygons

c) Transforming vertices

d) Generating fractal images

**Answer:** b) Clipping polygons

**Explanation:** The Sutherland-Hodgeman algorithm is primarily used for clipping polygons against a specified window or viewport.

## 117. In 2D graphics, which transformation changes the shape of an object by slanting it along an axis?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** d) Shearing

**Explanation:** Shearing transformation distorts the shape of an object by slanting or skewing it along one of its axes.

**118. Which algorithm is commonly used for filling polygons in computer graphics?**

a) DDA

b) Bresenham's line algorithm

c) Flood-fill

d) Midpoint circle algorithm

**Answer:** c) Flood-fill

**Explanation:** Flood-fill algorithm is commonly used to fill closed areas with color in computer graphics.

**119. What is the primary advantage of using composite transforms in computer graphics?**

a) They simplify the representation of objects

b) They reduce memory usage

c) They combine multiple transformations into a single operation

d) They improve rendering speed

**Answer:** c) They combine multiple transformations into a single operation

**Explanation:** Composite transforms combine multiple transformations, reducing the computational overhead by performing them as a single operation.

**120. Which of the following is true about homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify translation calculations by representing them as matrix multiplications, streamlining transformation operations.

## 121. What is the primary function of the window-to-viewport transformation in computer graphics?

a) To optimize the rendering process

b) To convert 3D scenes into 2D images

c) To map a portion of the world onto the display area

d) To manage transformations between different coordinate systems

**Answer:** c) To map a portion of the world onto the display area

**Explanation:** The window-to-viewport transformation maps a portion of the world defined by a window to the display area, adjusting the scale and position as needed.

## 122. Which algorithm is specifically designed for clipping lines against a rectangular window in computer graphics?

a) Bresenham's line algorithm

b) Cohen-Sutherland algorithm

c) Midpoint circle algorithm

d) Flood-fill algorithm

**Answer:** b) Cohen-Sutherland algorithm

**Explanation:** Cohen-Sutherland algorithm is designed specifically for clipping lines against a rectangular window in computer graphics.

## 123. What is the primary function of the flood-fill algorithm in computer graphics?

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer:** c) Filling closed areas with color

**Explanation:** The flood-fill algorithm is used to fill closed areas with a specified color in computer graphics.

## 124. In computer graphics, what is the primary purpose of the viewing coordinate reference frame?

a) To define the perspective of the viewer

b) To store texture data

c) To represent the object's position in 3D space

d) To map object coordinates to screen coordinates

**Answer:** a) To define the perspective of the viewer

**Explanation:** The viewing coordinate reference frame defines the perspective from which the scene is observed in computer graphics.

## 125. Which transformation is used to change the size of an object in computer graphics?

a) Translation

b) Scaling

c) Reflection

d) Shearing

**Answer:** b) Scaling

**Explanation:** Scaling transformation changes the size of an object in computer graphics, either uniformly or along specific

## 126. Which of the following transformations changes the orientation of an object?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** c) Rotation

**Explanation:** Rotation transformation changes the orientation of an object in computer graphics, rotating it around a specified axis or point.

## 127. What is the primary advantage of using homogeneous coordinates in computer graphics?

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify calculations involving translations, making it easier to perform transformations such as translation, rotation, scaling, and shearing.

## 128. What is the primary role of the Sutherland-Hodgeman algorithm in computer graphics?

a) Clipping lines

b) Clipping polygons

c) Transforming vertices

d) Generating fractal images

**Answer:** b) Clipping polygons

**Explanation:** The Sutherland-Hodgeman algorithm is primarily used for clipping polygons against a rectangular clipping window in computer graphics.

## 129. In 2D graphics, which transformation changes the shape of an object by slanting it along an axis?

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** d) Shearing

**Explanation:** Shearing transformation changes the shape of an object by slanting it along an axis, distorting its proportions while maintaining its size.

**130. Which algorithm is commonly used for filling polygons in computer graphics?**

a) DDA

b) Bresenham's line algorithm

c) Flood-fill

d) Midpoint circle algorithm

**Answer:** c) Flood-fill

**Explanation:** The flood-fill algorithm is commonly used for filling closed areas with color in computer graphics, such as filling the interior of polygons.

**131. What is the primary advantage of using composite transforms in computer graphics?**

a) They simplify the representation of objects

b) They reduce memory usage

c) They combine multiple transformations into a single operation

d) They improve rendering speed

**Answer:** c) They combine multiple transformations into a single operation

**Explanation:** Composite transforms simplify the application of multiple transformations to objects by combining them into a single operation, reducing computational overhead.

**132. Which of the following is true about homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** Homogeneous coordinates simplify calculations involving translations by allowing translations to be represented as matrix multiplications, streamlining transformation operations.

## 133. What is the primary function of the window-to-viewport transformation in computer graphics?

a) To optimize the rendering process

b) To convert 3D scenes into 2D images

c) To map a portion of the world onto the display area

d) To manage transformations between different coordinate systems

**Answer:** c) To map a portion of the world onto the display area

**Explanation:** The window-to-viewport transformation maps a portion of the world coordinates onto the display area, determining which part of the scene will be visible on the screen.

## 134. Which algorithm is specifically designed for clipping lines against a rectangular window in computer graphics?

a) Bresenham's line algorithm

b) Cohen-Sutherland algorithm

c) Midpoint circle algorithm

d) Flood-fill algorithm

**Answer:** b) Cohen-Sutherland algorithm

**Explanation:** The Cohen-Sutherland algorithm is designed specifically for clipping lines against a rectangular window or viewport in computer graphics.

## 135. What is the primary function of the flood-fill algorithm in computer graphics?

a) Drawing circles

b) Clipping polygons

c) Filling closed areas with color

d) Converting vector graphics to raster images

**Answer:** c) Filling closed areas with color

**Explanation:** The flood-fill algorithm is used to fill closed areas with a specified color in computer graphics, such as filling the interior of polygons or regions bounded by curves.

## 136. In computer graphics, what is the primary purpose of the viewing coordinate reference frame?

a) To define the perspective of the viewer

b) To store texture data

c) To represent the object's position in 3D space

d) To map object coordinates to screen coordinates

**Answer:** a) To define the perspective of the viewer

**Explanation:** The viewing coordinate reference frame is used to define the perspective of the viewer or camera in a 3D scene, determining how the scene will be viewed from a particular viewpoint.

**137. Which transformation is used to change the size of an object in computer graphics?**

a) Translation

b) Scaling

c) Reflection

d) Shearing

**Answer:** b) Scaling

**c:** Scaling is the transformation used to change the size of an object in computer graphics. It involves multiplying the coordinates of the object by scaling factors along each axis.

**138. Which of the following transformations changes the orientation of an object?**

a) Translation

b) Scaling

c) Rotation

d) Shearing

**Answer:** c) Rotation

**Explanation:** Rotation is the transformation that changes the orientation of an object in computer graphics. It involves rotating the object around a specified point or axis.

**139. What is the primary advantage of using homogeneous coordinates in computer graphics?**

a) They simplify calculations involving translations

b) They reduce memory usage

c) They improve rendering speed

d) They enhance color accuracy

**Answer:** a) They simplify calculations involving translations

**Explanation:** The primary advantage of using homogeneous coordinates in computer graphics is that they simplify calculations involving translations. Homogeneous coordinates allow translation operations to be represented as matrix multiplications, making them more convenient for transformation computations.

## 140. What is the primary role of the Sutherland-Hodgeman algorithm in computer graphics?

a) Clipping lines

b) Clipping polygons

c) Transforming vertices

d) Generating fractal images

**Answer**: b) Clipping polygons

**Explanation:** The Sutherland-Hodgman algorithm in computer graphics is primarily used for clipping polygons. It is an algorithm that clips a polygon against each side of a rectangular clipping window, resulting in a clipped polygon that fits within the window boundaries.