Computer Graphics Interview Questions

A list of frequently asked **Computer Graphics Interview Questions** and Answers are given below.

1) What is Computer Graphics?

Computer graphics involves display, manipulation, storage of images, and experimental information for proper visualization.

A computer graphics system consisting of

- o   Host computer
- o   Processor
- o   Memory
- o   Frame Buffer
- o   Display Device
- o   A set of an input device

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2) Write the properties of video display devices?

Properties of video display methods are Persistence, resolution, and aspect ratio.

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3) Write the essential application of computer-graphic?

Following is the application of computer graphic

1. Computer graphics is used in the range of computer-aided design.
2. It is used to produce illustrations for documents or to generate slides for with projections.

3. The expert uses a combination of 3D modeling methods, texture mapping, drawing programs, and CAD software.
4. In the field of entertainment, CG techniques are now commonly used in making motion pictures. Music videos and television shows.
5. Computer-generated models of physical, financial, and economical methods are used as educational aids.

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4) Write the difference between vector and raster graphics?

Following are the difference between vector and raster graphics:

1. Raster or Bitmap images are resolution-dependent because of this, it's not possible to increase or reduce their size without sacrificing on image quality.

While the vector-based display is not dependent on resolution, the range of vector image can be increased or reduced without affecting image quality.

2. Unlike a raster image, a vector picture can't be used for realistic pictures. This is because vector images are made up of solid-color areas and scientific gradients, so they can't be used to demonstrate the continuous tone of colors in a natural photograph.

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5) What are the advantages and disadvantages of direct view storage tubes?

Advantages:

o Refreshing is not necessarily.
o Without flicker, very complex images can be exhibit at very high resolution.
o Refreshing of the screen is not needed.

Disadvantages:

o They normally never display color.

- Selected part of the picture never deleted.
- It can take quite a few second for composite images while redrawing and eliminating the process.

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6) Define Aspect Ratio?

Aspect ratio is the ratio of the vertical points to horizontal points essential to produce equivalent length line in both direction on the screen. An aspect ratio of 3/4 defines that a vertical line plotted with three points has the same length as a horizontal lines plotted with four points.

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7) Differentiate between Raster and Vector Graphics?

Raster Graphics	Vector Graphics
Raster graphics are consist of pixels	Vector graphics are consist of paths
Raster image pixels do not include their appearance as to size increases	Vector image do retain appearance regardless of estimate.
Raster graphics are not scalable	Vector images are scalable

8) What are the advantage and disadvantages of DDA Algorithm?

Advantage:

- It is the most straightforward algorithm.
- It is a faster process for calculating pixel positions.

Disadvantage:

- Floating-point arithmetic in DDA technique is time-consuming.

o   Endpoint accuracy is poor.

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9) Difference between DDA and Bresenham's line drawing algorithm.

Basics	DDA Algorithm	Bresenham's line Algorithms
Arithmetic	DDA algorithm uses floating point, i.e., Real Arithmetic's.	Bresenhams algorithm uses fixed point, i.e., Integer Arithmetic's.
Operations	DDA algorithms uses multiplication and division in its operation.	Bresenhams algorithm use only subtraction and addition in its operations.
Speed	DDA algorithm is slowly than Bresenham's algorithm inline drawing because it uses real arithmetic (floating-point methods).	Bresenhams algorithm is faster than the DDA algorithm inline drawing because it performs only addition and subtractions in its calculation and uses only integer arithmetic, so it runs significantly fast.
Accuracy & Efficiency	DDA algorithms is not as accurate and efficient as Bresenham's algorithm.	Bresenham's algorithm is much accurate than the DDA algorithms.
Drawing	DDA algorithm can draw circle and curves, but which is not as accurate as Bresenhams	Bresenhams algorithm can draw circle and curves with much more accuracy than DDA Algorithm.
Expensive	DDA algorithm uses an excessive number of floating-point multiplications, so it is costly.	Bresenhams algorithm is less costly than the DDA algorithm as it uses only addition and subtraction.

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10) What is Translation?

A translation is used to an object by repositioning it along a straight line path from one co-ordinate point to another. We translate a 2-D points by adding translation distance, tx, and ty, to the original coordinates position (x,y) to move the points to a new position (x', y').

$$x' = = x + tx$$

y' = y + ty.

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11) What is Reflection?

A Reflection is a transformation which produces a mirror display of an object. The mirror image for a 2D reflection is created relative to an axis of reflection by rotating the objects 180 degrees about the reflection axis.

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12) What is Shearing?

A transformation which distorts the shape of an object such that the transformed way develop as if the object were consist of internal layers that had been caused to slide over each other is known as shearing.

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13) What is viewing transformation?

The mapping of a component of a world-coordinate scene to device coordinates is called a viewing transformation.

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14) Define Clipping and Clip window.

Any method that identifies those portions of a display that are either inside or outside of a particular region of space is referred to as a clipping algorithm or simply clipping. The region against which an object is clipped is known a clip window.

15) Differentiate between parallel projections from perspective projection.

Parallel Projection	Perspective Projection
In parallel projection, coordinate positions are changed to the view plane along parallel lines.	In perspective projection, object positions are changed to the view plane along lines that converge to a point known as a projection reference point or center of projection.
Preserves the related proportions of objects.	Produce realistic vision but does not keep relative proportions.
It is used in drafting to produce scale drawings of 3Dobjects.	Projections of distant objects are lower than the projections of objects of the same size that are near to the projection plane.

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16) What is the need for space partitioning representation?

Space partitioning representations are used to define interior methods, by partitioning the spatial domain including an object into a set of small non-overlapping, and contiguous solids. A common space partitioning description for a three object is an octree representation.

17) What is the quadric surfaces?

Quadric surfaces are described with second-degree equations (quadrics). They include sphere, ellipsoids, tori, paraboloids, and hyperboloids. Spheres and ellipsoids are necessary components of graphic scenes; they are often feasible in graphics packages from which more complex object can be constructed.

18) What is critical fusion frequency?

Frequency of light simulation at which it becomes perceived as a stable, continuous sensation. The frequency depends upon various factors like luminance, color, contrast, etc.

19) Difference between CMY and HSV color models.

CMY Model	HSV Model
A color model described with the primary colors cyan, magenta, and yellow (CMY) is useful for defining color output to hard-copy devices.	The HSV model uses color descriptors that have a more natural appeal to the user. Color function in this model is hue (H), saturation (S) and value(V).
Hard-copy devices such as plotters produce a Color image by coating a paper with color pigments.	To give color specification, a user selects a spectral color and the amounts of black and white that are to be added to obtain different shades, tints, and tones.

20) What is dithering?

The name dithering is used in different contexts. Primarily, it defines techniques for approximating halftones without reducing resolutions pixel: grid patterns do. But the term is also applied to halftone approximation methods using pixel grids and sometimes it is used to define to color halftone approximation only.

Random values added to pixel intensities to breakup contours are referred to as dither noise.

21) List out the various properties that describe the characteristics of light.

Reflection

Refraction

Dispersion

Interference

Diffraction

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22) What is an animation?

Computer Animation usually defines any time sequence of visual transformation in a scene. In adding to the dynamic area with translations or rotations, computer-generated animations could exhibit time innovation in object dimension, color, transparency, or surface texture. Animations often transition from one object shape to another.

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23) Define Keyframe systems.

Key-frame systems are specialized animation languages designed to generate the in-between frames from user-specified keyframes. Each object in the scene is described as a set of rigid bodies connected at the joints and with a limited number of degree of freedom. In-between frames are generated from the specification of two or more fey frames. Motion paths can be given by kinematic description as a set of spline curves or physically based by specifying the force acting on the object to be animated.

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24) What is Fractals?

Fractals are those who have the property of a shape that has the same degree of roughness no matter how much it is magnified. A fractal appears the same at every scale.

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25) What is a Turtle Graphics Program?

Turtle Graphics is a procedure in computer graphics for programming vector graphics utilizing a relative cursor upon a Cartesian plane. Turtle graphics is a vital characteristic of the Logo Programming language.

The following functions describe the turtle.

a.   Position of the turtle (x, y)

  b. Title of the turtle 0 the angle from the x-axis.

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26) List the attributes of turtle in graphics.

Turtle	graphics	has	three	attributes
Current		Position		location
Current		direction		Orientation
Pen				

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27) Differentiate Mandelbrot sets and Julia sets.

Mandelbrot sets	Julia sets
A very famous fractal is obtained from the Mandelbrot set, which is a set of complex values z that do not diverge under squaring transformation $z0=z$ $zk=z2k-1+z0$ $k=1, 2, 3.$	For some functions, the boundary between those points that move towards those points that move towards infinity and those that tends toward a finite limit is a fractal. The boundary of the fractal is called the Julia set.
It is the black inner fragment, which develops to consist of a cardioid along with several wart-like circles glued to it. Its border is complicated, and this complexity can be explored by zooming in on a portion of the border	Julia sets are extremely complicated sets of points in the complex plane. There is a various Julia set Jc for each value of c.

28) What is the Koch curve?

The Koch curve can be drawn by separate line into 4 equal segments with scaling method 1/3., and middle 2 segments are so adapted that they form adjustment sides of an equilateral triangle.

29) What are Morphing and tweening?

Transformation of object shape from one form to another is known as morphing.

Tweening is the process, which applies to animation objects defined by a sequence of points, and that change shape from frame to frame.

30) What are Peano curves?

A fractal curve can fill the plane and therefore have a dimension of two. Such curves are called Peano curves.

31) What is a Scripting system?

Scripting systems allow object specifications and animation sequences to be defined with a user input string. From the script, a library of different objects and motions can be constructed.

32) Define refresh/frame buffer.

Picture definition is saved in a memory area known as the refresh buffer or frame buffer. This memory area keeps the set of intensity values for all the screen points.

The frame buffer is where the image generation data is stored in the method of Video Display Monitors like CRT, Raster Scan, Random Scan, LCD, LED, etc.

33) What is the resolutions?

The maximum number of point that can be presented without overlap on a Cathode Ray Tube is indicated to as the resolutions.

Resolution is the number of points per centimeters which can be plotted crosswise and vertically, although it is established as the total number of points in each direction.

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34) Define Window and viewport.

A world-coordinate area selected for display is known as a window.

An area on the display device to which a windows is mapped is known as a viewport.

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35) Distinguish between window port and viewport?

A portion of a picture that is to be presented by a window is known as Window port.

The display method of the part selected or the design in which the selected element is viewed is called a viewport.

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36) What are blobby objects?

Some objects do not provide a fixed shape but change their surface features in certain motions or when in proximity to other objects. These objects are called as blobby objects since their shapes display a certain degree of fluidness.

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37) What are the Spline curves?

The name spline is a flexible strip used to generate a smooth curve through a designated set of points. In computer Graphics, the name spline curves define to any combined curve create with polynomial portions fulfilling specified continuity methods at the edge of the pieces.

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38) What is the advantages of B spline over Bezier curve?

The degree of B-spline polynomial can be set separately of the number of control points.

B-Spline allows local authority over the shape of a spline curve or surface.

A Bezier curve is a particular polynomial task, usually either cubic or quadratic, that describes a curve that goes from point A to point B given some control points in between. A Bezier spline is a collection of n of these.

39) What is a Rasterizations?

The phase of determining the appropriate pixels for representing images or graphics object is called a rasterization.

40) How will you represent a curve in graphics?

The curve can be created from an input set of mathematical tasks defining the objects or from a set of user-specified points. When tasks are specified, a package can project the describing equations for a curve to the display plane and plot pixel methods along the path of the projected plane.

41) Mention the uses of Chromaticity Diagram?

The chromaticity diagram is generally used to calculate a color against a gamut. The assumption is that if the chromaticity of the color distortion within the gamut line, then the color maybe copied on that device, or maybe described by that color system.

42) What is interactive computer Graphics?

Interactive computer Graphics like a website, it is only beneficial if a visitor browser it and no two visitors are precisely alike. It defines the website must provide the

interaction of the customer with a variety of skills, interests, and end objective. Interactive computer graphics contains the user's interaction.

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43) What does it mean by RGB?

RGB is a color model; it is an additive color image in which red, green, and blue lights are added composed in various methods to reproduce a broad display of colors. The term of the model comes from the labels of the three additive primary colors, red, green, and blue. The main objective of the RGB color model is for the sensing, defining, and display of pictures in electronic systems, such as televisions and computers, though it has also been utilizing in conventional photography.

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44) What is VDU?

A monitor or display known as a visual display unit is a portion of electrical machinery which displays images created by an appliance such as computers, without producing a permanent data. The monitor composes the display device, circuitry, and an enclosure. The display device in modern monitors is usually a thin film transistor liquid crystal display (TFT-LCD), while previous monitors use a cathode ray tube (CRT).

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45) What is Projection?

The process of displaying 3D into a 2D display unit is called a projection. The projection changes 3D objects into a 2D projection plane.

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46) What are the advantages of electrostatic plotters?

1. They are quicker than pen plotters and large-quality printers.
2. New electrostatic plotters contain a scan-conversion capability.
3. Color electrostatic plotters are feasible. They make different passes over the paper to plot color images.

47) What are the advantages of laser printers?

1. Large speed, precision, and economy.
2. Low-cost to maintain.
3. Quality printers.
4. Lasts for high time.
5. Toner power is very in-expensive.

48) List some 3D viewing devices.

1. Stereoscopic systems
2. Virtual reality systems

49) What is meant by Addressability?

Addressability is the number of particular dots per inch (d.p.i.) that can be developed. If the location of the current dot is (x, y), then the next dot will be (x + y), (x + y + 1), etc.

50) What is scan-code?

When the key is pressed on the keyboard, the keyboard auditor places a code import to the key pressed into a part of memory called a keyboard buffer. This code is known as the scan-code.