**UNIT 1**

**Graphics Primitives:**

Computer graphics is an art of drawing pictures on computer screens with the help of programming. It involves computations, creation, and manipulation of data. In other words, we can say that computer graphics is a rendering tool for the generation and manipulation of images.

**What is computer Graphics?**

Computer graphics is an art of drawing pictures, lines, charts, etc. using computers with the help of programming. Computer graphics image is made up of number of pixels. Pixel is the smallest addressable graphical unit represented on the computer screen.

**Introduction**

* Computer is information processing machine. User needs to communicate with computer and the computer graphics is one of the most effective and commonly used ways of communication with the user.
* It displays the information in the form of graphical objects such as pictures, charts, diagram and graphs.
* Graphical objects convey more information in less time and easily understandable formats for example statically graph shown in stock exchange.
* In computer graphics picture or graphics objects are presented as a collection of discrete pixels.
* We can control intensity and color of pixel which decide how picture look like.
* The special procedure determines which pixel will provide the best approximation to the desired picture or graphics object this process is known as Rasterization.
* The process of representing continuous picture or graphics object as a collection of discrete pixels is called Scan Conversion.

**Advantages of computer graphics**

* Computer graphics is one of the most effective and commonly used ways of communication with computer.
* It provides tools for producing picture of “real-world” as well as synthetic objects such as mathematical surfaces in 4D and of data that have no inherent geometry such as survey result.
* It has ability to show moving pictures thus possible to produce animations with computer graphics.
* With the use of computer graphics we can control the animation by adjusting the speed, portion of picture in view the amount of detail shown and so on.
* It provides tools called motion dynamics. In which user can move objects as well as observes as per requirement for example walk throw made by builder to show flat interior and surrounding.
* It provides facility called update dynamics. With this we can change the shape color and other properties of object.
* Now in recent development of digital signal processing and audio synthesis chip the interactive graphics can now provide audio feedback along with the graphical feed backs.

**Application of computer graphics**

* User interface: - Visual object which we observe on screen which communicates with user is one of the most useful applications of the computer graphics.
* Plotting of graphics and chart in industry, business, government and educational organizations drawing like bars, pie-charts, histogram’s are very useful for quick and good decision making.
* Office automation and desktop publishing: - It is used for creation and dissemination of information. It is used in in-house creation and printing of documents which contains text, tables, graphs and other forms of drawn or scanned images or picture.
* Computer aided drafting and design: - It uses graphics to design components and system such as automobile bodies structures of building etc.
* Simulation and animation: - Use of graphics in simulation makes mathematic models and mechanical systems more realistic and easy to study.
* Art and commerce: - There are many tools provided by graphics which allows used to make their picture animated and attracted which are used in advertising.
* Process control: - Now a day’s automation is used which is graphically displayed on the screen.
* Cartography: - Computer graphics is also used to represent geographic maps, weather maps, oceanographic charts etc.
* Education and training: - Computer graphics can be used to generate models of physical, financial and economic systems. These models can be used as educational aids.
* Image processing: - It is used to process image by changing property of the image.